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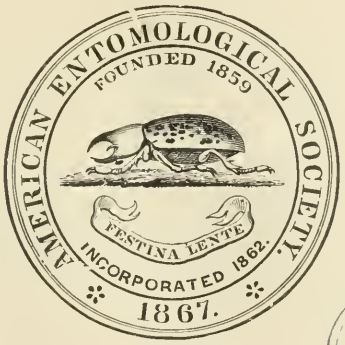

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TRANSACTIONS

OF THE

AMERICAN ENTOMOLOGICAL SOCIETY.

VOLUME XXXIII.

NEW NORTH AMERICAN TORTRICIDÆ.

BY W. D. KEARFOTT.

Evetria monophylliana sp. nov.

Expanse 15–19 mm.

Head: whitish-gray, mixed with brown and reddish scales; palpi light brownish-fuscous; thorax whitish-gray, striped with shades of brown and bright red scales; antennæ light gray; abdomen missing on all four specimens; legs whitish, dusted with fuscous.

Forewing: white on the basal fourth and upper half from base to outer third, the ground color of the lower half, beyond the basal fourth and the apical third is a light pinkish-fawn or salmon. There are two transverse irregular bands of scattered fuscous-brown scales on basal fourth, with a few salmon dots in middle of the outer. There is a broad fuscous-brown fascia, more or less overlaid with salmon from middle of costa, through white ground color only, stopping at the salmon color. On each side of this the costa, in the white area, is evenly dotted with four or five fuscous-brown streaks. Above the salmon of the outer third the costa is narrowly white, on which are two groups of fuscous-brown scales, below each the salmon shade is more intense, of a coppery hue. Extreme edge of dorsum white, dotted with brown. Before a white preciliate line the termen is edged with bright red, slightly enlarged and mixed with a few blackish scales in the middle. Cilia inwardly red, outwardly pink, with a few scattered gray scales.

Hindwing: pale gray, cilia white, with a gray basal line; underside whitish, dusted with fuscous in apex, cilia white.

Underside forewing: grayish fuscous, two large white costal spots before apex, cilia leaden, with whitish basal line.

Four specimens from collections U. S. Nat. Mus. Bearing labels "On *Sinus monophylla*;" Coso Valley, May 91, K;" "Argus Mts., May 91, K." In the Century Atlas both Coso Valley and Argus Mountains are shown in Kern Co., Cal.

Cotypes in U. S. Nat. Mus. and my collection.

Evetria sabiniana sp. nov.

Expanse 22–23 mm.

Head: whitish, tinged with salmon on sides; palpi white, lightly tinged with pink on sides; thorax white, mottled with salmon; antenna light salmon; abdomen white, anal tuft yellowish; legs salmon, thinly banded and dusted with white.

Forewing: salmon, with a broad white fascia across middle of wing and a narrower white fascia across wing at outer third. The white fasciæ are edged with shining scales, and a short line of the same cross wing before apex. These shining scales are white in the fasciæ and salmon elsewhere. The outer fascia is forked at costa, enclosing a small dot of salmon, between it and apex are two other obscure white costal dots. In the middle of wing at base is a streak of scales that are more of a pink shade than the salmon. Cilia white.

Hindwing: pale straw color, cilia white; underside the same, but darker below costa. Underside forewing ochreous yellow, dotted with white on costa, cilia white.

One specimen from collections U. S. Nat. Mus., bearing labels, "Sacramento Co., Cal.," "Augt. 9, '85," "3820," "43," "Larva on *Pinus sabiniana*," and a label in Walsingham's handwriting "*Steganoptica* n. sp. allied to *sinicolana* and *buolana* of Europe, left wings to W. 186."

One specimen from J. G. Grundel, Santa Clara, Cal., emerged from pine gum, June 20, 1904. This last specimen is darker than the first; the head, palpi, and thorax are shades of pinkish brown; the forewing is also more of a brownish pink, but the fasciæ, shining scales, and other marks are the same in both.

Cotypes in the U. S. Nat. Mus. and my collection.

Evetria zozana sp. nov.

Expanse 20 mm.

Head: pale fawn, mixed salmon, collar pale straw color; palpi very pale fawn within, speckled with light fuscous, externally reddish-salmon; antenna gray; thorax reddish-salmon in front and base of patagia, the balance gray, speckled with white; abdomen fuscous; legs speckled, cinereous gray and white.

Forewing: inner two-thirds white, heavily reticulated with blackish fuscous, somewhat concentrated in two darker fascia at inner fourth and middle, the latter is overlaid with dull ochreous scales on lower two-thirds. The outer third is reddish, divided by a whitish-pink fascia composed of a large spot below costa and another one above anal angle. The inner half of this reddish area is overlaid with dull ochreous on lower half; the outer portion, outlining termen, is intense red and forms a narrow fascia which is enlarged a third below costa and continuous to costa before apex as an ochreous streak. Beyond the red terminal band is a narrow white preciliate line. The cilia are pinkish, with a speckled white and gray line dividing this color below apex and superceding the pink at the anal angle.

Hindwing: smoky fuscous, darker at apex, cilia fuscous, with a darker line at base and a lighter line beyond.

Underside paler than upper. Underside forewing smoky fuscous, cilia paler, preceded by a white basal line, and with the ends of the pink scales overlapping on upper half.

One specimen, Placer Co., Cal., April 20; collected by Arthur H. Vachell.

Type in my collection.

Evetria colfaxiana sp. nov.

Expanse 22 mm.

Head and thorax whitish, mixed with black scales; palpi fawn, outer joint dark brown; antennæ gray; abdomen gray, annulated with dark fuscous; anal tuft pale fawn; legs pale fawn, dusted with fuscous.

Forewing: whitish gray. Base narrowly black, mottled with gray, succeeded by a whitish gray fascia, narrow on costa, broad on dorsum, followed by a broader dark fascia, black only on edges, overlaid in middle with gray, and above this a streak of ochreous; the outer line of this fascia is from costa at outer fourth, obliquely straight to fold, then concave to dorsum at inner third. Beyond this the ground color predominates, with a triangular spot on dorsum, at anal angle, sending a line of black scales from its upper end to costa at outer fourth, below costa this line connects with another shorter one which goes outside of ocellus. The broad whitish gray middle area is transversed by two, wide apart, lines of black scales, and lightly mottled with darker gray; through the middle of cell and below fold are horizontal streaks of yellowish. The ocellus is a flattened oval, long axis vertical, of whitish shining scales, enclosing a vertical line of shining ochreous. Beyond it the apex is coppery yellow. There are five black and four whitish spots on costa beyond middle, the inner two join together below, making a large quadrate dark shade, from the fourth dark spot descends the line of black scales above mentioned and from the fifth a similar black line divides the coppery shade. All of these dark spots are overlaid in the middle with coppery brown. Cilia pale gray, mottled with fuscous.

Hindwings: fuscous, cilia whitish; underside gray, dotted with dark fuscous on costa. Underside forewings dark fuscous, mottled with black; costal spots repeated.

One specimen, Colfax, Placer Co., Cal., July; collected by Arthur H. Vachell.

Evetria pasadenana sp. nov.

Expanse 15–19 mm.

Head: reddish-ochreous; palpi creamy-ochreous inside, dark reddish outside; antenna fuscous; thorax fuscous gray, patagia reddish at base and tipped with grayish-white; abdomen light brownish fuscous; legs grayish-white, banded and powdered with dark brown.

Forewing: gray, overlaid with reddish-brown scales, becoming more red in outer third. There are five transverse geminate paler gray lines, at about equal distance apart, the outer, before apex, reaches only to middle of wing; where each touches costa is a paler dot. The terminal line is white, sending dashes of same color into cilia, over each vein, below apex; before this white line is a

darker red shade from apex to anal angle, enlarged at the middle of the wing, it is continued as a red spot on dorsum before angle, above this in middle of wing is a clear red spot and a less distinct one above it on costa. Cilia gray, shaded with ferruginous at apex.

Hindwing: grayish-fuscous, cilia same, divided by a slightly darker line close to base; underside the same, but cilia whiter. Underside forewings smoky fuscous, reddish at apex.

Three specimens, Pasadena, Cal., April 14, W. G. Dietz; Alameda Co., Cal., March; Carmel-by-the-Sea, Monterey Co., Cal., A. H. Vachell.

Evetria burkeana sp. nov.

Expanse, ♂, 26–28 mm.

Head: with short tuft above eyes and between antennæ, face flattened, small, with thorax whitish-gray, thickly dotted with fuscous-brown; "griseous." Eyes jet black, with irregular lines of reddish-brown. Palpi, basal and second joint with moderate flattened tuft above and below, increasing slightly in width to end of second joint, same color as head; third joint obtusely pointed, about half length of second and not concealed by tufts of second, black, except base, which is paler. Antennæ, basal joint enlarged, whitish, with a streak of black in front; outer joints shortly ciliated below, pale fuscous, length about one-half. Abdomen dark fuscous above and below, scales overlapping posterior edge of each segment pale cinereous; a slight ridge of same color on each side, anal tufts same. Legs whitish, first and second pairs rather heavily clouded with dark brown on femora and tibiæ, and all tarsi heavily annulate with brown.

Forewing: white, with numerous transverse lines and fasciæ of gray-brown. A broad fascia from costa to dorsum; with its inner edge on costa at middle and outer edge at three-quarters; on dorsum, inner edge at two-thirds and outer edge at angle; the inner edge is much indented below upper vein of cell by a rounded prominence of white which nearly divides it; below this, above dorsum is a similar but less deep indentation; the outer edge of fascia is nearly straight, but much broken and indented. Before the fascia, to base, the surface is rather evenly strigulated with black and white, with the following more prominent markings; below middle on dorsum from inner third to inner sixth an irregular dark blotch, its outer edge with two rounded projections (which are parallel to corresponding indentation in fascia); between this blotch and fascia the color is more white than black, making an illy-defined whitish fascia before the dark one and at about equal width; on costa, before dark fascia, are four geminated white streaks, only the two outer ones (in whitish fascia) are well defined. Apical fifth of wing above ocellic space grayish-brown, with a narrow line continuing down to anal angle, between this and dark fascia is a narrow fascia of white, strigulated with dark lines from costa to outer margin above angle. The apex is dark, with a preciliate paler line; before apex the costa is marked with five prominent black dots, the outer two of which are on outer white fascia and inner three on middle dark fascia. Cilia blackish, interrupted by four white dots below apex and three larger white dots around angle. The blackish lines and fascia are, of the forewing, all more or less overlaid with gray, giving less the appearance of black and white than of grayish-brown and white.

Hindwing: pale, smoky fuscous, cilia paler, with a darker then a lighter line.

Underside forewing very dark smoky fuscous above lower median vein, white below it; costa and cilia dotted evenly with white,

Underside hindwing whitish, costal half shaded and reticulated with fuscous, cilia same, with fuscous dashes at ends of veins.

Two males, Hoquiam, Washington, bred by Mr. Burke, from *Picea sitchensis*, and bearing Division of Forestry record label "4009–9[1] and 4009–9[2] Hopk. U. S."

Cotypes U. S. Nat. Mus. and in my collection.

Polychrosis aruncana sp. nov.

Expanse 8.5–11 mm.

Head and palpi clay-yellow, latter tinged with brown on outside of tufts and former with brown behind. Thorax clay-brown, thickly dotted with darker brown, tuft leaden-black. Abdomen fuscous, anal tuft and legs clay-yellow, latter dusted and annulate with brown.

Forewing: inner third pale grayish-blue, divided by a brown band from costa, which reaches only to upper edge of cell. Costa within this space marked with three black spots, edged on both sides with white. The central fascia is narrowest on costa at middle, its inner edge goes vertically to dorsal margin, its outer edge obliquely to anal angle. The flattened oval brown patch in apical fourth sends two spurs to costa, another from outer edge to termen and which follows termen to angle, and coalesces with the central fascia at angle. These brown areas are overlaid with black on upper half of wing, and with three horizontal black lines in the flattened oval, beyond the end of cell with shining golden ochreous on lower half. There are four geminate white spots on costa between middle and apex, from each extends below costa pale metallic-blue streaks, the inner one extends across the brown fascia to dorsum, but is separated into three spots by the brown color. The apical and the one before it send oblique streaks to termen. A line of the same scales borders lower half of termen. Cilia leaden blue, with two tiny dashes of white on outer ends of the cilia below apex.

Hindwing: dark smoky brown, cilia white outwardly; underside grayish-brown.

Underside forewing smoky brown, costal spots repeated.

Eight specimens, from Prof. C. H. Chittenden, in charge of breeding experiments at the Department of Agriculture, Washington, D. C., bred from larvæ on *Aruncus aruncus*. Record number 9215. Cabin John's Bridge, Md., issued May 10 to 21, 1900.

Can be distinguished from any other species in this genus by the golden yellow patches.

Polychrosis yaracana sp. nov.

Expanse 9–10.5 mm.

Palpi and head pale creamy-brown, a shade darker on outside of tufts of former and collar of latter. Antennæ the same color, brown between joints. Thorax same shade of brown as collar, tufts cinnamon-brown. Abdomen whitish-gray, ringed with fuscous-brown between each segment, tuft gray, tinged with yellow and speckled above with brown. Legs white annulate and dusted with brown.

Forewing: a conspicuous black spot rests on costa between inner third and middle, and as a central fascia continues to fold, but becomes brown below the middle of the wing; its inner edge is slightly oblique to middle of wing, then vertical towards dorsum, but before reaching latter it turns and the outer margin runs obliquely upward in a spur to the middle of wing; the brown of this spur is shaded with black and above the spur is a white semi-circular patch containing on its lower side a small dot of fuscous. Between base and this dark fascia the ground color is white, with three, nearly equidistant black lines from costa to middle of wing; the middle one inwardly outlines a pale brown fascia extending nearly to dorsum; the inner fourth of dorsal margin, below the fold, is overlaid with brown and black scales; and a few scales of the same colors mark the base above. The white ground color, inside the middle fascia, is heavily overlaid with gray on the upper half of wing, and a patch of the same on lower half just before fascia; along the dorsum the white extends beyond the fascia, nearly to outer fourth rather heavily overlaid with gray at the outer end. Beyond the dark central fascia is a large olivaceous brown patch, extending from below costa to anal angle, rounded on its outer edge and nearly straight in its inner. A line of steely-gray scales separate it from a smaller triangular patch of the same color, in dorsum, within anal angle; the steely-gray line continues to costa at outer fourth, but becomes white above the middle of wing, where it joins another white line from costa, which runs obliquely outward to middle of termen, a similar white streak from costa, before apex, runs into this at middle of termen. The latter is interrupted by a streak of black scales below apex, and both of these white lines are outlined with gray scales. A similar but shorter white line separates the brown patch from termen above the angle. In apex is a lunate patch of brown overlaid with black. Cilia leaden-gray, interrupted below apex and at middle by a whitish dash, and few scales of whitish at angle.

Hindwing: white, tinged with smoky-brown in apex and before margin. Outer ends of cilia white, shaded with pale brown within. Underside the same.

Underside forewing fuscous, with eight geminate white spots on costa, cilia dark leaden-gray.

Five specimens, collected at Cincinnati, Ohio, by Miss Annette F. Braun, April 29th to May 14th.

This species is nearer to the European *P. botrana* than any of the American species I have seen.

Polychrosis magnoliana sp. nov.

Expanse, ♂, 11.5 mm.; ♀, 12 mm.

Head, palpi, antennæ and thorax cinnamon-brown, thorax streaked with leaden-black before the tuft, and the outer ends of tuft reddish-brown. Abdomen fuscous, anal segment leaden, tuft ochreous. Legs creamy-white, powdered with blackish-brown.

Forewing: inner half leaden-blue, divided by a narrow transverse line, which is bluish above and brown below middle. The middle fascia extends from costa to dorsum, its inner edge nearly straight and vertical; it is narrow to middle, then broadens outwardly to double the width, and from the widest outward point curves inwardly to dorsum, where it is less wide than at costa; black above,

brown below middle of wing, and outlined by ochreous-brown scales. Just above the outer limb of fascia and at about the end of the cell is a conspicuous round spot of bright ochreous yellow, from the upper edge of which an ochreous streak goes obliquely towards costa. Above this is a small black quadrate patch on costa with a streak of blue separating it from the middle fascia. A flattened oval patch of brown occupies the most of the apical fourth, with a smaller rounded patch of same color on dorsum before angle; these brown patches are outlined with shining leaden-gray scales. A similar lunate patch occupies the extreme apex, brown, dotted with black. On the outer fourth of costa are three geminate ochreous dots. Cilia mottled ochreous-brown, with a dash of leaden below apex and at middle.

Hindwing: very dark smoky brown, cilia whitish, paler within. Underside fuscous, with a yellowish streak above cell.

Underside forewing dark smoky brown, with costal dots repeated, cilia brown with two leaden dashes in termen, below apex, and leaden above apex and at angle angle.

Five specimens, bred from larvæ in the leaves of swamp magnolia, Bennings Station, District of Columbia, and Moorestown, N. J. Pupated August 1–7; issued August 10–20.

Nearest to *P. liriodendrana*, but can be at once separated by the conspicuous yellow dot at the end of cell, which can be easily seen without the use of a lens.

Polychrosis vernoniana sp. nov.

Expanse 9–11 mm.

Head: light brown, pale fawn in front; palpi pale fawn within, dark brown outside; antenna fuscous; thorax coppery brown, with a middle and two lateral black stripes, tuft ferruginous; abdomen fuscous; legs whitish, dusted with brown.

Forewing: pale bluish-gray. A large triangular fascia in middle of wing, the inner edge nearly a straight vertical line from costa to dorsum, the outer edge from costa curves outward and upward to end of cell, thence obliquely inward to dorsum. In the outer fourth is a large brown spot, touching anal angle below, and the costal edge above. At anal angle between these two is a small triangular brown spot. All of these three fasciæ and spots have horizontal black lines running through them. Above the outer limb of the fascia and the terminal spot, the space below costa is covered with ochreous brown scales mottled with darker brown. The costa is marked with fine line and dashes from base to apex. In the apex is an ocellated brown spot. The bluish, slightly shining ground color in this species is in well-defined bands; before the middle a narrow transverse band, between which and base is another of same width but more obscure. A narrow band surrounds the large terminal spot, except where the latter touches middle of termen, this band sends a spur into costa and into dorsal margin. Cilia blackish above, brown at angle angle, with a bluish reflection.

Hindwing: dark smoky brown, cilia white outwardly; underside a shade paler.

Underside forewing smoky fuscous, with eight or nine dull ochreous geminate spots on costa.

Twenty-one specimens, all bred from larvæ feeding in the flower heads and young seeds of *Vernonia noveboracensis*, Caldwell, N. J.; issued August 4th to 10th; District of Columbia, July 28th to August 7th; Dept. Agri., No. 3557, issued May 22d.

Polychrosis ambrosiana sp. nov.

Expanse 9-11 mm.

Head: pale fawn in front, darker over eyes and above; palpi very pale fawn, a shade darker on outside and apex; antenna brownish fuscous, becoming dark gray at outer end; thorax mottled, ochreous brown, black in centre; abdomen smoky black, anal tuft whitish above, cinereous beneath; legs very pale fawn, banded and dusted with fuscous.

Forewing: dull bluish gray, with a transverse brown band from middle of costa to anal angle, narrow and blackish brown on upper half, widest and lightest brown on lower half; an oblique line of the bluish ground color crosses this band on lower half of wing, cutting off a triangular spot on the dorsal margin. There is a narrow light brown fascia, mottled with darker brown close to base, and a finer darker line before this; a large patch of fawn-brown, mottled with darker brown covers apical part of wing, separated from the brown ocellate apical spot by a crescent-shape line of bluish-gray. This patch, by a darker brown shade, forms a large lunate spot in middle of wing before termen, which sends a long spur into termen at middle, another into anal angle, and in upper end is connected with the fawn-brown streak along costa. The costal edge is fawn-brown, with fine lines and dashes of darker brown and black. Cilia blackish-fuscous, becoming brown at anal angle.

Hindwing: smoky fuscous, cilia whitish.

Underside both wings dark silvery-gray, costa dotted with pale fawn.

Fifteen specimens, bred from larvæ feeding in the seeds of *Ambrosia trifidi*, from Cincinnati, Ohio, forwarded by Miss Annette F. Braun, and one specimen bred many years ago from the same seeds by Miss Mary E. Murtfeldt, at Kirkwood, Mo. Larvæ were full fed and pupating from Aug. 10th to 20th; moths issued Aug. 20th to Sept. 10th. There is a later brood which hibernate in the seeds as larvæ. I have one flown specimen from Miss Braun, captured May 14th.

Olethreutes gogana sp. nov.

Expanse 20 mm.

Head: dark fuscous; palpi dark fuscous, black outwardly, pale ochreous at base and underside of head; antenna dark fuscous; thorax black, patagia and posterior end streaked with reddish-brown; abdomen light fuscous, with long lateral tufts, anal tuft cinereous; legs cinereous dusted with black.

Forewing: dusky black, with obscure grayish-white shining fascia and spots. The most prominent is from inner fourth of costa to inner third of dorsum, broader on dorsal margin. There are two narrower bands from beyond middle of costa to dorsum of anal angle. There are three flattened spots under the costa

between the twin fasciæ and apex, and a streak from below the middle one to termen at middle, then to anal angle. In the apex is a large rounded spot of ochreous, all of the spots in apical third of wing contain ochreous scales; and a sprinkling of same over the balance of the wing. Cilia shining fuscous, preceded by an ochreous line.

Hindwing: smoky gray, cilia light gray; underside same. Underside hindwing a shade darker, costal spots repeated, and an ochreous preciliate line.

One ♂ specimen, Wellington, B. C., April 4th, collected by G. W. Taylor.

Olethreutes galaxana sp. nov.

Expanse 21 to 23 mm.

Head: ochreish-brown, mixed with black scales; palpi same shade of brown outside, paler inside, with a few scales at outer end of tuft, and apical joint black; antenna shining yellowish-gray; thorax black, thickly speckled with ochreish-brown, and tips of patagia same color; abdomen blackish-fuscous, posterior edge of each segment pale yellowish-white, anal tuft pale ochreous; legs fuscous black, thinly ringed and dusted with pale ochreous.

Forewing: pale ochreous-brown or light fawn, with basal patch, middle and outer fascia black, the dark areas outlined by shining steel-blue metallic scales.

The dark basal area is more or less overlaid with brown scales; it reaches to inner sixth on costa, is widest above middle of wing, is sharply indented below middle. The middle dark fascia is, from costa before middle, as a flattened ovate spot to below cell; to its inner, lower edge is joined a similar but smaller spot which completes the fascia to dorsal margin. The outer fascia begins at outer fourth of costa as a small spot on costa, enlarges immediately below costa, and, as a large, flattened ovate spot, extends nearly to termen above anal angle and fills more than half the area beyond cell. Below it, and separated only by the metallic line, is a rounded dark spot on dorsum before anal angle. The costa in the dark basal area is lightly speckled with brown, between this and middle fascia with three geminate brown and black dots, in the outer half with four geminate brown spots, becoming whitish on entering edge of costa. The four lines of metallic scales in outer half of wing begin at these germinate spots. A narrow apical area beyond the last metallic line is black, overlaid with brown. Cilia shining leaden.

Hindwing: Grayish-fuscous; cilia shining, lighter fuscous, with a darker line near base; underside, both wings, same as upper side of hindwing. Costal spots repeated.

Three specimens, Vernon, B. C., April 13th and May 18th, Victoria, B. C.

Olethreutes glitranana sp. nov.

Expanse 15 to 17 mm.

Head: pale fawn, mixed with black; palpi, pale fawn, shaded with black outside, apical joint blackish; antenna pale fawn; thorax blackish-fuscous, edged with pale fawn; abdomen black, each segment posteriorly edged with white; tuft light ochreous; legs light ochreous, banded and dusted with black.

Forewing: two distinct, narrow creamy-ochreous, clouded with pale brown fasciæ, the inner at inner third and outer at outer third on a ground color of black rather heavily covered with light reddish-brown scales, the latter thicker in api-

cal third. The inner pale fascia form two geminate spots on costa; from the inner a broken line of steel-blue metallic scales, starting on the inside edge of fascia, crosses it, and on lower half outlines the outer edge; from the outer geminate spot a short line of metallic bounds the outer edge of fascia. There are two similar geminate spots and metallic lines from outer pale fascia; the inner line is much broken, but in dots outlines the inner edge of fascia; the outer metallic line follows outer edge of fascia to middle, then goes nearly to anal angle, but does not connect with a small group of metallic scales at that point. There are two geminate costal spots before apex, from the inner a metallic line margins termen nearly to anal angle; from the outer a short metallic line defines a darker apical spot; between these lines is a streak or narrow fascia of reddish-brown. There is a blackish preciliate line preceded by an irregular mottled line. The cilia is shining leaden at apex, cream color below, with dashes of brownish-fuscous in middle of wing and outwardly edged with this color below middle.

Hindwing: smoky, dark brown; cilia cream-white with a fuscous basal line; underside the same, but somewhat mottled with pale fawn; underside forewing smoky, dark brown; costal dots repeated.

Ten specimens, Aweme, Manitoba, June 39th to July 5th, Norman Criddle; Regina, Assa., July 2d, T. N. Willing; Winnipeg, Man., A. W. Hanham.

Olethreutes coronana sp. nov.

Expanse 16 to 19 mm.

Head: pale fawn, mixed with a few black scales on top; palpi pale fawn, blackish on outer end of tuft and with a black dot above on outside of second and first joints; antenna whitish-fawn; thorax fawn in which black is mixed; ends of patagia paler fawn; abdomen blackish-fuscous, posteriorly each segment edged with whitish; anal tuft yellowish-ochreous, darker at base; legs dark cream, banded and powdered with blackish-brown.

Forewing: pale olivaceous brown or light fawn, mottled with black and crossed by a number of steely-blue metallic lines. The black scales are closer together forming a dark fascial shade across wing at middle; inner edge straight, outer edge rounded; its width at middle is half the width of wing. A similar but less distinct dark shade beyond end of cell, starting from the two middle of the four geminate costal spots on outer half; its inner edge slightly concave to dorsal margin, its outer edge sweeping around before termen. The paler fascia between these is narrower than the outer dark fascia, and is divided at its lower third, sending a branch to anal angle and one to outer fourth of dorsum, and enclosing in the fork a triangular darker spot. The metallic irregularly separates these lighter and darker areas. A short metallic line from costa before apex outlines a small brown spot. Cilia cream-white with a small spot of fuscous in apex, and similar dashes at ends of veins 3, 4, and 5.

Hindwing: cream-white, lightly dotted with brownish-fuscous around margin, and veins 6 and 7 overlaid with same color beyond the cell; cilia whitish with a darker basal line; underside the same with less brown scales. Underside forewing olivaceous brown, mottled with yellowish-white before termen and costal spots repeated in same color.

Three specimens, Aweme, Man., July 9th and 31st, Norman Criddle; Beulah, Man., Aug. 15th, A. J. Dennis.

Olethreutes rosaschreana sp. nov.

Expanse 12.5 to 14 mm.

Head: dark rose, tinged with ochreous behind, and the frontal scales tipped with black; palpi dark rose, ochreous within; antenna grayish-fuscous; thorax dark rose, ochreous in centre; abdomen silvery-fuscous; legs cream-white dusted with dark brown.

Forewing: above fold dark rose, below fold orange-ochreous, except at extreme base and at outer end, where the ochreous merges into the prevailing rose color. There is a shining patch of paler rose on upper third of wing between base and middle; the upper edge of this merges into ochreous on costa. There is a similar patch of paler shining rose scales in the ocellic area; it follows termen from lower third around angle to outer fifth of dorsum; its upper edge nearly reaches middle of wing, and sends a rounded process inward before curving downward and outward to dorsum; near its upper edge are a few metallic scales. Between this patch and the ochreous dorsal patch there is a blackish-rose shade along outer third of fold. On the costa between inner third and apex are five geminate, very oblique yellowish streaks, the inner is in the light rose shining patch; from the streak in middle of wing is a long streak of shining rose paralleling costa and curving gradually before apex and termen, ending in the latter below middle. This shining streak is bounded inwardly by a broader streak of dull rose. Between the shining streak and apical margin, including upper half of termen, the interspaces between veins dull ochreous, and the dull rose over the veins is outwardly lightly strigulated with whitish-yellow. Before the black preciliate line is a line of dull rose shaded with black over veins. Near the outer end of cell are two spots of leaden fuscous, the smaller near upper edge and larger near lower edge of cell. Cilia rose, becoming gray at anal angle and touched with blackish at end of each vein.

Hindwing: dull, smoky brown; cilia same, but shining, with a darker basal line; underside, both wings the same.

Six specimens, Florida, from Prof. Fernald's collection. Cotypes in his and my collection.

The wing coloration of this species is allied to *Malachitana* Lell.

Olethreutes ochromediana sp. nov.

Expanse 11.5 to 12 mm.

Head: mixed ochreous and black, paler ochreous in front and base of antenna; palpi pale ochreous, two black spots on outside of second joint; apical joint black; antenna grayish-fuscous; thorax ochreous, patagia and posterior tuft blackish-fuscous; abdomen grayish-fuscous, anal tuft pale yellow; legs creamy-white dusted with dark fuscous.

Forewing: basal area and apical third mottled black, ochreous and shining blue lines. The middle of the wing is covered by a broad ochreish fascia, commencing as a narrow spot on costa but swelling out below and covering half the dorsum. Its inner edge begins on costa at inner third, is nearly straight for a third the width of wing, then curves convexly to dorsum at inner fourth; the outer edge begins close beyond the inner edge, curves convexly to dorsum at outer fourth; it is dentate, sending out spurs at upper fourth, middle, and lower

third. Between the fascia and base is an ochreous costal spot that sends a line to dorsum, but is interrupted at fold. Beyond the fascia are several ochreous streaks, the inner connecting with an ochreous and black patch; the one from middle of wing sends a curving fascia under costa to anal angle before termen. On the outer third the ochreous spots merge together in a continuous streak below costa. The dark ground color is almost entirely overlaid or dotted with metallic blue. There are some black vertical lines from ocellus to above middle of wing. The ocellus is not clearly defined, consisting of an irregular line of steely-blue scales defined on each side by these black lines. Cilia pinkish-fuscous.

Hindwing: smoky fuscous, slightly paler at base, cilia whitish; underside both wings grayish-fuscous; forewing a shade darker with costal spots repeated on extreme edge.

Three specimens, Hazleton, Pa., June 4th and July 14th, Dr. Dietz; Hampton, N. H., July 25th, S. Albert Shaw.

Allied to and very much like *osmundana* Fern., but entirely lacks the shining whitish bands in the outer half of that species as well as its well-defined spot on dorsum before anal angle.

Olethreutes daeckeana sp. nov.

Expanse 17 to 19 mm.

Head: black, mixed with pink scales; palpi pale fawn, black outwardly and apically; antenna blackish-fuscous; thorax blue-black; patagia mottled, pale fuscous and pink; abdomen fuscous; legs cinereous, dusted and banded with black.

Forewing: mottled, shining, dull blue-black and pinkish-ochreous. There is a transverse fascia in middle of wing of velvety-black scales, changing to dull ochreous at dorsum; the inner edge is indented four times; the outer edge gives off three long spurs about equally separated. A smaller black spot is on fold at inner fourth; a disconnected black streak runs from it to base, and above it on costa is another. There is a lunate black spot before apex and a black line from anal angle to above middle of wing. The black spots are generally outwardly outlined with reddish-ochreous. The balance of the ground color is shining dull-blue, dotted with black and pinkish-ochreous. Before the middle the costa is marked with six short reddish-ochreous dashes; there are four larger wedge-shaped streaks of same color on outer half; the two outer join below costa and send a line paralleling termen to middle of wing; the outer ends of veins before termen are outlined with black. Cilia bluish-fuscous with a darker line at base.

Hindwing: coppery-brown; cilia fuscous with darker basal line; underside, both wings the same; forewing less coppery and more grayish-fuscous.

Ten specimens, bred from larvæ boring in the stalks and flowers of the pitcher plant, *Sarracenia purpurea*, at Toms River, N. J., and Brown's Mills Junction, N. J., issued July 4th to Aug. 4th, all collected and bred by Mr. E. Daecke, in whose honor the species is named.

This species belongs to the group in which are *hebesana* Walk. and *agilana* Clem.

Olethreutes wellingtoniana sp. nov.

Expanse 18 mm.

Head: fuscous, hoary-white on top; palpi cinereous, outer joint dark brown, antenna cinereous; thorax mottled white and fuscous: abdomen yellowish; legs ashy-white, shaded with dark brown.

Forewing: mottled, white, gray, dark fuscous and black. The darker scales form a fascia across wing beyond middle; the inner edge from costa at middle curving slightly inward to middle of wing; thence more or less distinctly to dorsum; the outer edge from costa at three-fifths from base, angles outwardly to middle of cell, then obliquely inward to dorsum before angle. It contains a whitish shade in outer angle, and is mottled with black above middle, with an occasional ferruginous scale. Before this is a white fascia, only clearly defined on upper half; before this is a darker shade, not definite enough to call a fascia, it contains four black dots in middle of wing, two above and two below fold.

The small basal area is slightly paler. Beyond the principal dark fascia, the apical fourth is white, with four indistinct large gray costal spots, the inner two sending a gray shade curving toward termen then to anal angle.

There is a row of seven or eight terminal black dots, the three upper ones the most distinct. Cilia grayish-fuscous, with a whitish basal line.

Hindwing: cinereous-gray, cilia same; underside same shade but mottled with fuscous.

Underside forewing dark cinereous gray, costal spots repeated and line at terminal dots faintly repeated.

Two specimens, Wellington, Br. Col., May 19th, collected by Rev. George W. Taylor.

Olethreutes separatana sp. nov.

Expanse 12–15 mm.

Head: black; palpi black, fuscous within; antenna fuscous; thorax black, patagia pale lilac, with a black spot near base, posterior tuft bronzy-black; thorax, inner half, cinereous, outer half fuscous; legs grayish-white, banded and dusted with dark brown.

Forewing: outer two-fifths pale lilaceous-white, with four pale fuscous costal streaks and a shade of the same color before termen. A small black dot in middle of wing at end of cell; and a gray shade at anal angle. The inner three-fifths of wing is mottled black and gray, with a lilaceous patch from base to inner fourth on upper half of wing which connects by a few pale scales with a geminate quadrate spot between dorsum and fold before middle of wing. Cilia pinkish-fuscous, paler at angle.

Hindwing: smoky brown, cilia whitish; underside yellowish-gray, mottled with fuscous

Underside forewing: smoky fuscous, costal dots repeated.

Nine specimens, Essex Co., N. J., June 14th to 15th; New Brighton, Pa., June 2d and Aug. 20th, J. A. Merrick; Washington Co., Ark., Aug., A. J. Brown; Cincinnati, Ohio, June 17th, Miss Braun.

This species has been wrongly identified as *O. dimidiana* Sodoff. in almost all collections. *Dimidiana* is a darker species. It has a spot on costa at inner third, and the blackish area comes much closer to anal angle. It does not have the pale shade from base and the pale spot on dorsum before middle. Have never seen a North American specimen at all like the European *dimidiana*, and do not believe it occurs on this continent.

Olethreutes mana sp. nov.

Expanse 18 mm.

Head: ferruginous and black; palpi pale cinereous, outer end of tuft and apical joint blackish; antenna brownish-fuscous, blackish at base; thorax brown, posterior tuft black; abdomen fuscous; legs yellowish-white, banded and dusted with blackish-brown.

Forewing: inner three-fifths yellowish-brown, vertically strigulated with wavy darker brown and fuscous, which on the costa form darker dots; below the fold on the inner half is a whitish shade, with a cluster of long blackish scales on the dorsum before it. The outer two-fifths is creamy-white, with a shade of fine fuscous dots before apex, divided by a line of raised shining cream-white scales; there is a small patch of leaden scales above middle of wing at end of cell, surrounded by a ring of white raised scales, with a small tuft of the same above and below, the latter running to anal angle and continued along termen to middle. There is a leaden spot in middle of wing near end of cell and another below it on the dorsum, both in the dark area. The dark and whitish areas are rather sharply defined, the division being straight from outer third of costa to middle of dorsum. There are four blackish dots on costa in white area, and black scales are over each vein forming a terminal row, at the apex the black scales are more frequent, Cilia dirty white, becoming fuscous and black at apex.

Hindwing: smoky brown, cilia white, with a dark basal line; underside creamy-white, mottled and outward strigulated with brownish fuscous.

Underside forewing: smoky fuscous, dotted with creamy-white along costa and an preapical line of the same shade.

Two specimens, Black Jack Springs, Texas, Dr. Barnes; Victoria, Texas, April 10th, E. A. Schwartz.

Should be placed in list between *nimbatana* Clem. and *separatana* Kearf.

Cotypes in U. S. Nat. Mus. and my collection.

Olethreutes rubipunctana sp. nov.

Expanse 17–22 mm.

Head: light brown on top, black in front and over eyes; palpi light brown inside, smoky black outside, apical joint black, tipped with light brown; thorax centre black, pale fawn at base of tuft, tuft saffron-red, patagia fuscous at base becoming pale fawn outwardly; abdomen grayish-fuscous, tuft pale ochreous; legs yellowish-white, banded and dusted with dark brown.

Forewing: the outer third pinkish-white, inner two-thirds mottled with shades of brown and black. In the middle of wing is a large black patch, its upper edge

touching costa, and lower nearly to middle of wing, about as wide as deep, two streaks of brown scales divide it in some specimens. There is a shade of dull slate-blue before and below it, and a few scales of the color on its outer edge beneath costa. Between the slate-blue streak and dorsal margin the fascia is continued of light brown mixed with black. Below the inner half of slate-blue scales is a pinkish-white patch on dorsum, and above it a light mottled brown patch to costa, the three forming a paler fascia. Inside of this pale fascia the basal area is mottled shades of brown, shaded outwardly with black below costa and below middle. On the dorsum at base is a patch of slate-blue. In the outer third white area there is a conspicuous spot above dorsum, inside the ocellic area, of two or three short vertical lines of brown and black, and a more or less distinct single line running up to middle of wing. There is a broken narrow band of black and brown scales from costal spot before apex to termen below middle, crossed on veins 6 and 7 by bluish lines; in some specimens the bluish vein lines, with the black interspaces at their outer ends closely resemble the rim and spokes of a fifteen degree wheel segment. On the costa, in the whitish area, are four large saffron spots; the apical spot is black, edged with saffron. Ciling shining dark blue, dusky at apex, whitish at anal angle, a fine whitish basal line preceded by black terminal line.

Hindwing: light coppery-brown, cilia whitish, underside gray, with a coppery deflection.

Underside forewing: smoky black, with large paler mottlings on costa and outer end.

Six specimens, Placer Co., Cal., May 1st, Vachell; Cisco, Cal., June 1st, Vachell; San Luis Obispo, Cal., March, Vachell; Colorado, No. 2693, Gillette.

Cotypes in U. S. Nat. Mus. and my collection.

Olethreutes removana sp. nov.

Expanse 17–21 mm.

Head, palpi and antenna grayish-brown; thorax gray, tips of tuft and patagia pink; thorax, golden-gray tufts of long scales, on side whitish, anal tuft golden-brown; legs cream-white, banded and dusted with dark brown.

Forewing: dark gray, mottled with a darker shade. The color of wing is nearly a uniform gray, with all marking obsolete, with the eye can be seen a faintly darker line from middle of costa to anal angle; with a lens there is a darker shade at inner fourth of costa forming an inner fascia, entirely obsolete below middle of wing, and along costa slightly darker costal spots separated by a shade lighter gray. In the middle of wing before termen is a darker shade. Cilia concolorous.

Hindwing: light smoky brown, cilia whitish, darker at apex, underside whitish-brown, darker along termen and mottled below costa.

Underside forewing: dark fuscous-gray, with large whitish geminate costal spots.

Four specimens. New Brighton, Pa., Aug. 21st, F. A. Merrick; Algonquin, Ill., June 25th, Dr. Nason; Aweme, Man., Aug. 16th, Norman Criddle; Chicago, Ill., June, J. H. Reading.

Olethreutes provana sp. nov.

Expanse 22 mm.

Head and thorax yellowish-white, posterior tuft black; palpi light brown; shaded with black on outside; antennæ light fuscous; abdomen yellowish brown, legs yellowish-white, dusted with dark brown.

Forewing: white, with an inner and middle dark fascia, the beginning of an outer fascia and two dark spots on costa between latter and apex.

The fasciæ and spots are white, dotted with black and edged with black. The inner fascia is very close to base and encloses a small basal patch of white, its outer edge starts at inner sixth, and is indented in middle of wing, reaching dorsum at inner third; the middle fascia consists of three superimposed spots, the upper at middle of costa, its lower end pointed and touching the middle one which is oval and horizontal, the dorsal spot is before anal angles and well defined on inner side only. The outer semi-fascia is in the shape of a large rounded spot on outer third of costa and reaching to upper third of wing, between it and dorsum is a small shade of dark scales. The two inner fascia are somewhat overcast with yellowish, and the outer spots with olivaceous gray. Between the inner and middle fasciæ the ground color forms a distinctly outlined white fascia, with a few vertical strigulations of gray, Before the termen is a line of black scales, not reaching apex and below middle broken into three dots. Cilia grayish fuscous, with a darker line at base.

Hindwing: pale brown, darker outwardly, cilia whitish and darker basal line. Underside yellowish-white mottled at apex.

Underside forewing: smoky brown, mottled with darker, costal spot repeated.

One ♂ specimen. Wellington, B. C., April, Rev. George W. Taylor.

Olethreutes devotana sp. nov.

Expanse 14 to 15 mm.

Head and palpi fawn-brown; antenna gray, brown at base; thorax reddish-purple; patagia lilaceous-gray and the same color at base of tuft; abdomen and legs pale-ochreous, latter faintly dusted with brown.

Forewing: blackish-bronzy-brown, overlaid with metallic-blue on inner half below costal spots and on dorsum before anal angle. In the middle of dorsum is a large rounded cream-white spot; the apical fifth of wing is cream-white, indented by a brown shade from apex, opposite the inner end of which is a round patch of metallic-blue; thus the white is nearly divided into two spots, the smaller, triangular one on costa before apex and the larger one lying within the lower half of termen. There is a dot of blue in the latter near its upper edge, and an oblique streak of blue crosses the dark apical shade from the costal spot before it. Over the ocellic area are shining white scales. Cilia brown at apex, white below middle.

Hindwing and underside both wings fuscous-brown.

Three specimens. Hastings, Fla., June 8th, A. T. Brown; Ch. Harbor, Fla., March (Hulst collection), Dr. Dietz; Florida, Prof. Fernald.

Cotypes in Prof. Fernald's and my collection.

Eucosma pandana sp. nov.

Expanse 24 to 28 mm.

Head, palpi and thorax whitish-cinereous, speckled with brownish-fuscous; apical joint of palpi black; antenna cinereous; abdomen pale cinereous; legs whitish, dusted with fuscous.

Forewing: dark reddish-brown, heavily overlaid with white-tipped scales; the whitish color forms a wide fascia from middle of costa to dorsum; its inner line angles outwardly to middle of wing, then obliquely inward to inner fourth of dorsum. The outer line is not clearly defined, but is as a shade from middle of costa to outer fourth of dorsum. Beyond this and parallel to it is a band of the darker color, outwardly edged with whitish scales; it curves inward slightly at end of cell and terminates in anal angle. On the outer third of costa are four obscure dark costal spots outlined with white. The ocellus consists of an irregular cluster of slightly shining whitish scales. Cilia same as wing, preceded by an irregular line of white.

Hindwing: light smoky-fuscous; cilia paler and preceded by a darker band. Underside smoky-fuscous, strigulated with fuscous. Underside forewing smoky-fuscous, minutely dotted with whitish; costa dotted with pale-ochreous and dark-brown spots.

Five specimens. Wilgus, Cochise Co., Ariz., Dr. Barnes; Kerrville, Texas, Dr. Barnes.

Eucosma nandana sp. nov.

Expanse 26 to 30 mm.

Head: brownish-gray, speckled with whitish; palpi gray-black, speckled with whitish; antenna light fuscous; abdomen pale cinereous, speckled with light brown; anal tuft reddish-brown; legs whitish, powdered with brownish-fuscous.

Forewing: ochreous-gray; the tips of many of the scales are white, giving a powdered appearance over the whole surface; the ochreous-gray are replaced by blackish-brown scales in an obscurely defined band from inner third of dorsum to outer three-fifths of costa. This dark fascia is clearly defined on its outer edge, and is indented a quarter below costa. In some specimens the dark shade extends to base; in others it is lost before reaching the inner fourth. On the outer end of wing a similar darker line starts from near apex, obliquely, to end of cell in middle of wing, then angles outward, then inward to dorsal margin at outer fourth. Beyond this are some dark vertical strigulæ. The dark lines are caused by the absence of the white tips to the scales. Cilia brown, thickly dotted with white.

Hindwing: pale fuscous in ♂, darker fuscous in ♀; cilia fuscous, dotted with darker scales; underside pale cinereous; underside forewing smoky-brown.

Six specimens. Rounthwaite, July, Marmont; Regina, Sept., Willing; Chicago, Ill.; Iowa, Gillette, Acac. Cat., 142.

Cotype in U. S. Nat. Mus.

Eucosma mandana sp. nov.

Expanse 18–19 mm.

Head, thorax and antenna rusty brown; palpi cream color, fuscous outwardly; abdomen whitish-fuscous, tuft darker; legs whitish-fuscous, dusted with brown.

Forewing: rusty brown, mottled with darker brown on costa, the outer half of costa obliquely striped with reddish and pink lines, between these are lines of dull leaden scales, the longest extending from outer fourth of costa to middle of termen. The ocellic spot contains two or three short black lines, the vertical sidebars are dull leaden. Cilia gray, powdered with black.

Hindwing: light fuscous, cilia whitish; underside the same.

Underside forewing: smoky fuscous, ochreous-brown on costa, mottled with darker brown.

Four specimens. Montclair, N. J., July 1st, Light Trap; Washington, D. C., June, at light, A. Busck; Plummer's Island, Md., July 9th, A. Busck.

Cotype in U. S. Nat. Mus.

Eucosma landana sp. nov.

Expanse 23 mm.

Head, palpi and thorax black, finely speckled with whitish-gray; antennæ fuscous; abdomen whitish-gray; mottled with fuscous; legs whitish, powdered with gray above and annulated with brownish fuscous on the tarsi.

Forewing: dark gray, evenly speckled all over with whitish. Cilia pale gray, speckled with whitish internally.

Hindwing: light smoky fuscous, with darker mottlings around external edge, cilia whitish; underside light ochreous-fuscous, mottled along costa with brown and a few dots of same color along outer margin.

Underside forewing: same as hind wing, but a shade more gray and less ochreous, mottled with brown along costa and external margin.

Four specimens. Rounthwaite, Manitoba, Can., April 25th, collected by L. E. Marmont; Aweme, Man., May 18th to June 12th, Norman Criddle.

This species is unlike any Tortricid I have ever seen; its very distinctive and unique color plan will make it easily recognizable.

Eucosma canariana sp. nov.

Expanse 28–34 mm.

Head: canary-yellow; palpi pale clay-brown; antennæ same as palpi, yellow at base; thorax canary-yellow, somewhat paler in the middle and the ends of patagia; abdomen cream color; legs, pale clay-color, with a yellowish tinge.

Forewing: shining silvery-white, with two canary-yellow lines from base to termen; the upper line starts on costa at base, continues in a straight line to termen, where it curves up and ends at extreme apex; the second line begins at the middle of base, continues in a slightly curved line below the fold to anal angle, at end of cell it sends an oblique spur up to the upper line; at the anal angle it continues up to the termen for a distance equal to its own width, then continues up through the cilia almost to the apex. These yellow lines are lightly dotted with brown on their outer ends. Cilia, except as noted, pale yellowish-cream. Male costal fold yellow.

Hindwing: pale fuscous, cilia white; underside whitish.

Underside hindwing: smoky fuscous, cream color along costa.

Eight specimens. Stockton, Utah, Aug. 1st to 11th, Tom Spalding; Utah, July, O. C. Poling; Southwestern Colorado, July 11th and 14th, W. E. Dietz; Glenwood Springs, Colo., Aug., W. E. Dietz.

This species is closely allied to *E. crambitana* Wlsm. The lines of the latter are Indian red; the upper line ends in a strong fork, and the spur from lower to upper line is absent.

Eucosma fandana sp. nov.

Expanse 32 mm.

Head and thorax olivaceous-yellow; palpi and antennæ pale clay color; abdomen silvery white, anal tuft pale clay; legs white, dusted with pale fuscous.

Forewing: a light olivaceous-yellow, with two silvery-white horizontal lines. The upper begins on costa at inner fourth and ends in apex, beyond the middle the costa along this line is edged with yellow. The second starts at base, and runs in nearly a straight line through middle of wing nearly to termen, at its outer end it turns upward and points towards apex. At the extreme base the white color spreads to dorsal margin. Cilia yellowish-cream.

Hindwing: fuscous, cilia white, clouded with fuscous; underside paler fuscous, white along costa.

Underside forewing: smoky fuscous, yellowish along costa and white below vein 1*b*.

One specimen. Denver, Colo., Oslar.

Belongs in the same group as *crambitana* Wlsm. and *canariana* Kearf., but whereas in these two species the silvery white is the predominant color, in this one the reverse is the case.

Eucosma spaldingana sp. nov.

Expanse 14–20 mm.

Head, palpi, thorax and abdomen white; antennæ pale fuscous, with a whitish bloom; legs white, dusted with light brown.

Forewing: silvery-white, with two transverse narrow bands, and patch in apical end pale clay-yellow, rather heavily overlaid with Indian-red scales. The inner line starts from inner fourth of dorsum, and reaches costa at inner third, it follows costa to beyond half and again crosses wing, obliquely to dorsum, before anal angle, where it broadens out and covers the outer third of dorsum. From middle of wing at end of cell it sends a spur into apex, this broadens below apex into a large patch covering the upper two-thirds of outer fourth, with a few scattered scales continuing along termen to anal angle. On the costa, just before apex, the dark color encloses a small spot of white. The male costal fold is of the dark color and a small patch of same below it. Cilia white.

Hindwing: silvery-whitish-fuscous; underside the same, cilia white.

Underside forewing: pale clay-yellow, mottled with pale brown.

Fourteen specimens. Stockton, Utah, June 19th to Aug. 11th; all collected by Tom Spalding.

Eucosma gandana sp. nov.

Expanse, ♀, 33 mm.

Head and thorax pale yellow; palpi and antennæ pale clay-yellow; abdomen white, with a faint yellowish reflection; legs cream color, dusted with darker clay-yellow.

Forewing: very pale yellow, without stripes or marks; a shade paler along costa and in outer fourth beyond cell. Cilia the same.

Hindwing: white, finely checkered with very light fuscous, cilia white. Underside the same.

Underside forewing: yellowish-fuscous.

One ♀. Denver, Colo., Sept. 10th, Oslar.

This species is of the same shape and general appearance as *crambitana* and *canariana*. I would not venture to describe it from one ♀ except that it can be easily recognized by its uniform wing coloring without marks of any kind.

Eucosma handana sp. nov.

Expanse 23–30 mm.

Head and thorax pale brown; antennæ pale brown, dusted with darker brown outwardly; antennæ clay-yellow; abdomen and legs pale fuscous, latter dusted with light brown.

Forewing: clay-yellow, rather heavily overlaid with pale pinkish terra-cotta-brown. There are no well defined fasciæ or spots; the darker shade forms an obscure triangular patch, with base resting on dorsal margin between inner and outer fourths, the point of the triangle reaching top of cell a third from base. On the outer third are vertical irrorations of shining clay-yellow. The edge of the costa is reticulated with the two shades. Cilia clay-yellow, inwardly edged with a slightly darker line.

Hindwing: pale clay-yellow, the veins overlaid with light terra cotta. Cilia whitish. Underside the same.

Underside forewing; clay-yellow, reticulated with pale brown.

Five specimens. Stockton, Utah, July; collected by Tom Spalding.

This species will go in the group of *grandiflavana* Wlsm. *subflavana* Wlsm. and *larana* Wlsm.

Eucosma kandana sp. nov.

Expanse 18–20 mm.

Head, palpi, antenna and thorax clay-yellow: abdomen whitish-yellow, tuft darker; legs pale clay-yellow.

Forewing: clay-yellow, reticulated along costa and outer third with very pale brown. There are several irregular vertical shining streaks of clay-yellow from costa before apex, two of which reach to anal angle and form the two vertical bars of an obscure ocellic spot, between and on each side of the bars and also in the apex are a few tiny dark brown dots. Cilia pale brown, dotted internally with dark brown.

Hindwing: much darker than forewing, smoky brown, cilia pale brown; underside the same but a shade lighter.

Underside forewing: sams as upperside of hindwing, with the reticulations repeated along the costa.

Six specimens. Stockton, Utah, Aug. 4th to 17th; collected by Tom Spalding.

This species belongs with the *irroratana* Wlsm. and *atomosana* Wlsm. group.

Eucosma floridana sp. nov.

Expanse 18–22 mm.

Head, palpi and thorax white, with large spots of very pale terra cotta on the crest of the head, base of antenna, posterior end of thorax and end of patagia; antenna whitish-fuscous; abdomen cinereous, anal tuft whitish-ochreous; legs pale terra cotta, dusted with fuscous.

Forewing: pale terra cotta, darker towards apex, lighter below costa, the extreme costa is a darker shade and profusely marked with white dots, the dots on the outer half are continued as lines of shining opalescent scales, from the outer fourth the line runs obliquely to termen below apex; the line before this, from costa between half and outer third, is somewhat broken and runs obliquely, paralelling the upper line, to vein 7, beyond end of cell, thence follows the vein to termen. Before the apex is a short vertical line, and dots of the shining whitish scales occur over the outer third of wing. The ocellic spot is large, whitish-gray, dotted with darker gray and blackish scales, inwardly the vertical bar of shining scales is irregular, the outer bar is missing, but a line of four or five dots of shining scales are in the outer edge of spot, Cilia gray, dotted with blackish.

Hindwing: light smoky fuscous, white above cell. Cilia gray-fuscous. Underside both wings smoky fuscous.

Forewing: darker and mottled with pale ochreous along costa.

Seven specimens. Hastings, Fla., Oct. 6th to 15th; collected by A. J. Brown.

This species will go in the group with *cataclystiana* Walk.

Eucosma randana sp. nov.

Expanse 24–28 mm.

Head, palpi and thorax grayish-brown; antenna and abdomen fuscous; legs whitish powdered with light brown.

Forewing: light ocherous-brown, closely strigulated on costa and outer half of wing with vertical black lines. Ocellic spot very large, white, with three horizontal rows of five each quadrate spots, overlaying these black spots, on the inside, in the middle and the outer edge are short vertical bars of raised (curved over, flattened), leaden, shining scales. There are five short lines of these same scales from costa between end of male costal fold and apex, each ending in a white spot on extreme edge of costa, the line before apex is longest and paralelling termen, ends above the bar outlining the ocellic spot. Four smaller dots before the ocellic spot. Cilia white, atomized with black.

Hindwing: smoky fuscous, cilia whitish; underside grayish-fuscous.

Underside forewing: dark smoky fuscous, with costal spots repeated in pale ochreous.

Eight specimens. Denver, Colo., Clear Creek, Colo., June 16th ; all collected by E. J. Oslar.

This species is very much like *E. circula* Hbn., but the size is very much larger, and the costal and ocellic spots are somewhat differently arranged.

Eucosma sandana sp. nov.

Expanse 19–24 mm.

Head: whitish clay-yellow: palpi white, dusted on outside with pale-clay yellow; antenna pale gray; thorax whitish in front, clay-yellow in middle and gray behind; abdomen shining cinereous, tuft clay-yellow; legs whitish, dusted with ochreous.

Forewing: ochreous-brown, inner half of costa, above cell, whitish, dotted with brown; ocellic spot large, covering almost the entire outer fourth of wing, finely dotted with black in a large round spot, in the lower half are three horizontal black lines, crossed by three vertical bars of shining golden scales. From the outer half of costa are two long lines of shining scales, the inner runs obliquely outward to end of cell, then vertically downward inside the ocellic spot, but separated from latter by a line of ground color; the outer runs obliquely, outlining the ocellic spot above to termen below apex. A few metallic dots on interior of wing. The outer half of costa is marked with small wedge-shaped whitish spots, separated by the brown ground color. Cilia gray, powdered with black dots.

Hindwing: pale gray, cilia whitish; underside the same.

Underside forewing: ochreous gray.

Three specimens. Volga, S. Dak., W. E. Dietz ; Chimney Gulch, Golden, Colo., Sept. 3, E. J. Oslar.

Eucosma reversana sp. nov.

Expanse 17–19 mm.

Head, thorax, palpi and abdomen white, shaded with pale brown on outer side of patagia and palpi; antenna white, finely annulated between joints with fuscous; legs white, powdered with clay-yellow.

Forewing: white, with grayish-brown spots and semi-fasciæ; below the costa these dark spots and bands all incline inward, that is, nearer the base on their lower ends and nearer the apex at their upper ends. There is an obscure patch of dark scales in middle of wing at base; from inner fourth of dorsal margin a fascia runs obliquely outward above middle of wing, broader at its upper end; a band lies obliquely over end of cell, twice as long as wide and not touching either costal or dorsal margin; on outer fourth of dorsum a short oblique patch borders inner side of ocellic spot; from apex is a short streak to middle of wing, broadening out below. The costa is marked with alternate white and brown dashes, the white dashes on outer half are geminate, and the pair before the apex curve downward and outward into termen below apex. Ocellic spot obscure, a few dots of dark brown, bounded on each side by vertical bars of shining white scales. Cilia white, dotted with black.

Hindwing: yellowish-gray, cilia white; underside the same.

Underside forewing: smoky gray, costal spots repeated.

Three specimens. San Antonio, Texas, Dr. Wm. Barnes.

This species much resembles *E. atomosana* Fern., but can readily be separated, as the direction of the stripes are reversed.

Eucosma brightonana sp. nov.

Expanse 13–16 mm.

Head, palpi and thorax grayish-brown; palpi, abdomen and legs fuscous.

Forewing: gray-brown; a large dark brown spot on dorsum, between inner fourth and middle, extending to middle of wing, pointed on top, rounded on sides; a smaller spot of same shape and color on dorsum before angle; from the middle of costa an irregular narrow fascia goes obliquely to middle of wing at end of cell, sending a wavy line down to the dorsal spot before angle. Beyond this is a paler gray brown fascia, beginning on fascia as a germinate spot, broadening below until it involves all of the ocellic space. Beyond it on costa are three paler geminate streaks. A darker shade in apex. Cilia dark gray.

Hindwing: smoky fuscous, cilia brownish-gray; underside of both wings the same, with a dark spot in apex of forewing.

Seven specimens. New Brighton, Pa., July 29th to Aug. 10th; all collected by F. A. Merrick.

Eucosma tandana sp. nov.

Expanse 20–22 mm.

Head, palpi, antenna and thorax grayish-brown, patagia whitish posteriorly; abdomen brownish-white; legs yellowish-white.

Forewings: grayish-brown, darker on the male fold, and the trace of a darker fascia from middle of costa; the costa in the outer half is faintly strigulated with brown. These marks are all very faint and inconspicuous. There are two prominent dark brown spots; one before the middle of wing, resting on dorsum, its upper end touching fold, it is about as wide as long and slightly rounded on the sides; in one specimen a streak of brown is continued up above middle of wing and connecting with the obscure central fascia. The other spot is in the apical end of the wing; it rests on costa before apex and extends down nearly to anal angle, it is nearly straight on its outer edge and convex on its inner edge, its length is twice as long as its width on costa, there is a narrow line of ground color between the upper two-thirds of its length and termen. Cilia gray-brown.

Hindwing: smoky brown, cilia paler; underside gray-brown, a shade darker along costa.

Underside forewing: smoky brown, spotted with dull ochreous along costa and termen.

Four specimens. Algonquin, Ill., July 8th, Dr. Nason; New Brighton, Pa., July 18th, F. A. Merrick; Arlington Heights, Ill., Aug. 15th, A. McElhose; Iowa, Ac. Cat. U. S. Nat. Mus., 985, Gillette.

Cotype in U. S. Nat. Mus.

Eucosma vandana sp. nov.

Expanse 12–16 mm.

Head, palpi and thorax whitish to grayish-brown, apical joint palpi black; antennæ whitish-gray; abdomen fuscous; legs whitish, powdered with brown.

Forewing: dull blackish-brown; obliquely striped with grayish-white along costa; the line from outer fourth runs to termen beneath apex, the line from costa, immediately before apex, follows termen to below middle. The ocellus is above the anal angle and consists of two broken horizontal lines of gray and white. Between the middle of wing and dorsum are oblique strigulæ of white, from the inner third to anal angle. Before this strigulation is a reddish-brown patch. Cilia gray-brown, dotted with pale fuscous. In some specimens these whitish lines are nearly obsolete, the entire surface of wing being a dull mottled blackish-brown.

Hindwing: dark smoky fuscous, cilia a shade paler; underside gray fuscous.

Underside forewing: smoky fuscous, flected with dull ochreous on costa.

Sixteen specimens. Hastings, Fla., March, April, and Oct.; collected by A. J. Brown.

Eucosma wandana sp. nov.

Expanse 17 mm.

Head and palpi ochreous-brown, blackish-brown at outer ends of tuft over eyes and outer ends of palpi; antenna blackish-brown, faintly annulated with ochreous-brown between joints; thorax black-brown; patagia ochreous-brown; abdomen blackish-fuscous, whitish beneath; legs whitish on underside, heavily powdered with fuscous above.

Forewing: blackish-brown, more or less mottled with gray and ochreous scales; beneath fold, in ocellic space and a small spot on costa before apex, grayish-ochreous. The ocellic spot contains three horizontal black lines, the vertical bars shining gray-white, the outer is broken. There is a conspicuous dark shade on fold from base to inner third, and beyond the outer end of it, above the gray-ochreous dorsal patch are a few white scales. From the costa beyond the male fold are four pairs of white dashes, becoming silvery metallic below costa; the inner pair send a broken line to the inner ocellic bar, the second pair send a line, which connects with a short line from the fourth pair, into the outer ocellic bar. There are two black dots below the fold, one close to base and the other about one-sixth from base. Cilia dark gray, dotted with black.

Hindwing: dark smoky brown, paler at base, cilia gray, underside smoky-brown.

Underside forewing: dark smoky brown; costal spots repeated.

One ♂ specimen. Cincinnati, Ohio, Aug. 25th; Miss Annette F. Braun (No. 164).

Eucosma xandana sp. nov.

Expanse 12–17.5 mm.

Head, palpi, antenna and thorax gray; apical joint, palpi black; abdomen fuscous; legs gray, tarsi powdered with black.

Forewing: pale whitish-gray, with two narrow brown-black fascia; the inner from inner fifth of costa to inner fourth of dorsum widens out at middle of

wing to three times its width above and narrows below middle to half the widest part; the outer starts from middle of costa and runs obliquely to dorsum before anal angle, the upper half is very narrow and convex outwardly, from middle to above fold it widens four times its width above but contracts slightly before reaching dorsum. On the ground color between base and first fascia are about six brown dots above fold and four below; between first and second fasciæ are two brown dots on costa and two below them, and two faint lines on dorsum; between second fascia and apex are seven brown dots in costa and one in apex, each is duplicated below costa; there is an irregular row of brown dots on termen and a short vertical line of same from anal angle, on each side of which are one or two scattered dots. Cilia pale fuscous, preceded by darker line.

Hindwing: pale gray, cilia same, but shining; underside the same.

Underside forewing: smoky gray, costa faintly dotted with brown.

Nine specimens. Cincinnati, Ohio, March 6th to 26th; collected by Miss Annette F. Braun.

Encosma yandana sp. nov.

Expanse 16-19 mm.

Head and antenna gray; palpi pale gray; thorax gray, speckled with brown; abdomen grayish-fuscous, anal tuft pale yellow; legs gray, tarsi annulated with brown.

Forewing: whitish-gray, lightly strigulated and dotted with fuscous. There is a semi-fascia from inner fourth of dorsal margin to middle of wing, with a small round dot above and below the fold. The middle fascia starts from middle of costa as a narrow brown line to end of cell where it widens out into a small patch of brown, then continues as a narrow line to outer fourth of dorsal margin. Between these fasciæ is a faint line of brown from dorsum to above middle. There is a small rounded patch of lighter brown in the apex and between it and male costal fold are four or five darker brown oblique costal lines. Between veins 6 and 7 is a row of four brown dots, with a vertical line of brown below the inner and outer to the dorsum. A terminal line of brown. Cilia shining grayish-fuscous.

Hindwing: gray, darker at apex, cilia light shining gray above and beneath.

Underside forewing: smoky gray, costal spots repeated, whitish-gray and brown along termen.

Nine specimens. New Brighton, Pa., March 26th to April 11th; collected by F. A. Merrick.

Encosma zandana sp. nov.

Expanse 14-16 mm.

Head, antenna, thorax and abdomen dark blackish-gray; palpi light gray, outer end of tuft and apical joint black; legs gray, dusted with dark brown.

Forewing: gray, mottled with darker shades of gray and brown. The lower half of wing between outer third and anal angle is whitish-gray, strigulated with oblique dark grayish-brown lines. The costa beyond the male costal fold is marked by six or seven brown-black dots, separated by gray. Beyond the cell on upper half of wing is a semi-circle of black dots, with the open side below. Cilia brownish-gray, preceded by a dark terminal line.

Hindwing: smoky brown, cilia shining gray-brown, underside the same.

Underside forewing: dull smoky brown, with dull ochreous spots on costa.

Seven specimens. Cincinnati, Ohio, March 26th to May 7th; collected by Miss Annette F. Braun.

Eucosma bobana sp. nov.

Expanse 22–26 mm.

Head: pale clay-yellow; palpi same, dusted with fuscous outwardly, apical joint fuscous; antenna pale clay-yellow, the segments dusted with brown; thorax pale clay-yellow, shaded with bright ochreous-brown in front and at base of patagia; thorax and legs whitish-gray, the latter dusted with light brown.

Forewing: alternate bands of bright ocherous and dark reddish-brown, these bands are broken and their direction changed at the middle of the wing, giving the surface a checkered appearance. The extreme base is narrowly white, followed by a wider ochreous band, then by a white band, marked below fold with an ochreous spot and on upper vein of cell with a brown spur from the next outer fascia, the latter begins at inner fifth on costa as a blackish streak, becomes narrow below costa to middle of wing, then widens to dorsal margin which it reaches at inner quarter, below the costa it is ochreous and brown, outwardly edged with dark brown. It is followed by a broader ochreous fascia, interrupted just above middle by a spur from the succeeding dark fascia. The latter begins as a rich brown spot on costa to upper vein of cell, where it is cut by a horizontal streak of black and brown scales, the downward continuation of the fascia starts from outer end of this streak, and is rich brown, having a strong lobe on its outer edge. Beyond this, above middle of wing, is a large patch of ochreous and white scales, with two brown dots on costa. Beyond it is a subapical brown and black patch, triangular in shape, with a point touching costa, an inner spur below the yellow patch before it, and a curved streak along the lower half of termen, this latter streak becomes yellow shortly before the middle. On the lower half of outer fourth is a curved ocherous patch, with a small dash of fuscous scales at anal angle. The ochreous patches and fasciæ are all outlined by white, and the brown patches usually outlined by black or darker brown. Cilia white, fuscous at apex, and two dashes of fuscous below apex.

Hindwing: pale fuscous, cilia white, underside whitish-gray, powdered with fuscous below costa.

Underside forewing: smoky fuscous, with costal spots repeated.

Three specimens. Salida, Colo., June 11th; Southwestern Colorado, July 13th; Harris Co., Texas, July 5th. All from Dr. W. G. Dietz.

Eucosma cocana sp. nov.

Expanse 19 mm.

Head: ochreous-brown, darker on sides and collar; palpi dull ochreous, outside and apex heavily dusted with blackish-gray; thorax ochreous-brown, crossed by two narrow lines of whitish, outer ends of patagia and posterior end of thorax gray and white; antenna dark fuscous; abdomen shining gray, anal tuft clay-yellow; legs whitish, heavily overlaid with speckled gray and brown scales.

Forewing: soft Indian-red, or the tint known as old-rose, crossed by numerous

vertical lines of shining gray raised scales; at the inner third there is a narrow transverse line of ochreous, and the ocellic patch is the same color, both edged with the gray lines. Between apex and first ochreous line are two other gray lines, somewhat broken; the extreme base is gray, sending a streak around dorsum to inner fourth. Between the ochreous fascia and ochreous ocellic spot is a broad, partly geminate band of gray. On the outer half of costa at end of each vein is a spot of gray. From the apex a gray line runs obliquely inward over vein 7, about half way to end of cell, then angles obliquely downward ending on termen over vein 5, and enclosing a terminal patch of bright ochreous. The male costal fold is dark gray, with three or four whitish spots at the beginning of the inner gray lines. Cilia gray, cut with white at end of each vein.

Hindwing: smoky brown, cilia pale fuscous; underside gray, mottled with fuscous below costa.

Underside forewing: smoky fuscous, whitish on termen, costal spots faintly repeated.

One ♂ specimen. Tryon, N. C., May 17th; collected by W. F. Fiske.

Eucosma sonomana sp. nov.

Expanse 20 mm.

Head: pale fawn; palpi pale fawn within, dark gray, speckled with whitish, without; outer joint black; antenna leaden gray, thinly annulated with white; thorax grayish-fawn, base of patagia reddish-ochreous; abdomen dark fuscous, anal tuft black; legs pale fawn, dusted with blackish fuscous.

Forewing: coppery-red, darker on inner half, shading into coppery-ochreous at termen. There are two shining leaden-gray transverse fascia, the inner from inner fourth of costa to inner third of dorsum is composed of two pairs of lines, the inner edge deeply concave in the middle, and with some irregular lines of the same color in base, enclosing a round spot of the reddish ground color. The outer fascia begins on costa beyond middle as two long whitish dashes. Contracts at top of cell, below which is an irregular ring of darker leaden scales which connect with a whitish line to dorsum at outer fourth, with a spur to anal angle. The inner of a pair of white dashes on costa, before apex, sends a whiitish shining line to middle of termen. Between this line and outer fascia the costa is marked with two white dashes and streaked with gray. Cilia white, with an outer edging of fuscous, and a dark fuscous basal line, below apex, which is interrupted by a white dash over each vein.

Hindwing: smoky gray, preceded by a darker line, following a paler basal line. Underside both wings the same, but forewing a shade darker and marked with white on costa, also white ciliate dashes repeated.

Three ♂ and one ♀. Sonoma Co., Cal., May; Carmel-by-the-Sea, Monterey Co., Cal., April. All collected by Arthur H. Vachell.

Eucosma dodana sp. nov.

Expanse 16.5–24 mm.

Head: cinereous; palpi ashy-gray; antenna fuscous; thorax black, speckled with cinereous; abdomen dark fuscous, lighter on side and tuft; legs pale gray, dotted with fuscous.

Forewing: light gray, with large spots and fasciæ of blackish-brown. The basal area extends in middle of wing to inner fourth, receding to costa and dorsum, it is black outwardly, gray towards base; on inner third of costa is a large black spot and another before anal angle on dorsum, a third one is between these two in the middle of wing over outer third of cell, the three forming a broken fascia. On the costa are three large black spots, with a fourth in apex, which enlarges below, then contracts and follows termen to anal angle. The gray areas between these dark spots are vertically strigulated with blackish-brown. This description is from the most intensely marked specimen, in others, the dark spots are contracted and the gray color predominates, sometimes dividing the spots, and in others the large dark spots are almost lost. Cilia yellowish-gray, dusted with fuscous.

Hindwing: dark gray, cilia paler; underside both wings a uniform gray, with costal spots repeated.

Ten specimens. Southwestern Colorado, July 13th, Dr. W. G. Dietz; Colorado, Dyar and Caudell.

Cotypes in U. S. Nat. Mus.

Eucosma fofana sp. nov.

Expanse 21 mm.

Head, palpi and thorax dark ochreous-gray, heavily dusted with fuscous, and dotted with black on patagia; antenna dark fuscous; abdomen grayish fuscous, tuft ochreous-fuscous; legs gray, banded with white and powdered with dark fuscous.

Forewing: whitish-gray, spotted and strigulated with black-brown. There is an obscure dark fascia from middle of costa obliquely towards anal angle, it is well defined only in upper third. There are four rather large black dots on costa beyond it, the fourth being in the apex; below the second of these dots are two superimposed irregular rings, each composed of five or six dark dots; below the third is another such ring, and below it a line of dots before termen above anal angle. The basal area is not definitely defined, all of the inner half of wing is an irregular mass of large and small dots on the whitish-gray ground. Cilia yellowish-gray, preceded by a darker line.

Hindwing: smoky gray, cilia the same, but tips of scales whitish; underside yellowish-gray.

Underside forewing: yellowish-gray, dark spots repeated along costa, and rows of dark dots between the veins beyond the cell.

One ♂ specimen. Berthoud Pass, Colo., Aug. 22d; collected by A. J. Snyder.

This species strongly resembles *dodana* Kearf., and may prove to be an extreme variety of it. There is a certain formation of the markings, however, that leads me to believe it is distinct.

Eucosma hohana sp. nov.

Expanse 20–22 mm.

Head yellowish-gray; palpi yellowish-gray, with a darker streak on lower, outer side of tuft; antenna gray, annulated above with paler gray; thorax gray,

finely dusted with darker gray; abdomen fuscous, anal tuft yellow; legs cinereous, heavily dusted with blackish-fuscous.

Forewing: whitish-gray, rather evenly dusted and dotted all over with blackish-brown; the costa is evenly marked with dark dots, about twelve beyond male costal fold, the outer ones are the largest; the dot beyond the middle and one on outer third are followed below by short lines of dots, opposite them on dorsum, two strigulæ rise almost to middle; between each pair of these the ground color is rather free from dark dots and appears lighter. There is an obscure shade from apex to lower end of cell, it widens out in the middle above and below, there is a similar but smaller shade in the middle of the wing. There is a whitish preciliate line; cilia fuscous, extreme tips whitish.

Hindwing: above and beneath light yellowish-gray, cilia same.

Underside forewing: smoky fuscous, darker spots on costa.

Two specimens. Mt. Piran, Alberta, Aug. 17th; Dr. Wm. Barnes.

Eucosma kokana sp. nov.

Expanse 20-21 mm.

Head, palpi, antenna and thorax gray, heavily dotted with fuscous; abdomen fuscous; legs pale clay-yellow, powdered with brown.

Forewing: whitish-gray, shaded with brown on interior of wing from base to end of cell. On outer half of costa are five flattened streaks of brown, from each of which is a line of brown below, the two interior join and run outward over vein 7, from the third and fourth the lines join a third below costa and continue as one into anal angle, the outer spot, before apex, is rounded, and has no line from it. Inside the termen is a brown line slightly concave towards its outer side. Cilia gray, dotted with fuscous-brown.

Hindwing: smoky gray, cilia paler, underside yellowish-gray.

Underside forewing: dark smoky gray, lightly dotted with dull ochreous along costa.

Two specimens. Cincinnati, Ohio, Nov. 3rd, Miss Annette F. Braun; Scranton, Pa., Oct. 8th, A. E. Lister.

The Scranton specimen is much lighter than the description, the lines in the outer third being obsolete and the brown shade over interior less dark.

Eucosma lolana sp. nov.

Head: yellowish-brown, lighter over eyes and in front; palpi yellowish brown, dark brown on outside; antenna cinereous, finely annulated with black; thorax dark brown, yellowish posteriorly and ends of patagia; abdomen fuscous, paler at outer ends of joints, tuft yellowish; legs cinereous, powdered and banded with dark brown.

Forewing: dark brown or black, heavily overlaid with ochreous-brown scales; there is a conspicuous white fascia from inner fourth of costa to inner third of dorsum, it is concave on its inner edge and slightly convex on the outer with a short spur a third from dorsum. There are three brown dots on costa of outer third of wing, enclosed by a cream-white patch which connects with the cream-white ocellic spot, forming an outer white fascia. There is a row of black dots

on each side of this outer fascia, and a few on the sides of the inner and many others in the dark ground color between the fascia and in basal area. There is a short vertical bar of leaden scales through the ocellic spot, and a few scales of the same color are scattered over the apical fourth. Cilia light fuscous, preceded by a darker line.

Hindwing and underside of both wings very dark smoky brown, cilia pale fuscous, costal spots repeated.

Two specimens; Colorado, Gillette and Dyar and Caudell. Cotype in U. S. Nat. Mus.

Eucosma monana sp. nov.

Expanse 22 mm.

Head and palpi clay-yellow, clouded with smoky black on bases of antennæ, tips of scales on collar, outer end of palpi and a spot of the same on upperside of second joint of palpi near its base; thorax black, mottled with gray; abdomen white, at end of each segment fuscous between; legs white, banded and powdered with black.

Forewing: white, lightly strigulated with pale fuscous; there is an obscure pale fuscous fascia at inner fourth, and much broader across wing beyond middle, its inner edge starts from before middle of costa and goes in a straight line obliquely to within a third of dorsum where it angles inward and reaches dorsum at outer third; the outer edge starts from outer third of costa and curves unevenly to anal angle. There is a narrow broken fascia from a quadrate black spot on costa before apex, which divides in the middle of wing, one limb following the termen and the other to anal angle. There is a lunate brown apical spot extending into the cilia as black scales. The costal edge is white, with numerous black dashes for its entire length. Cilia below apex leaden-gray, cut with three or four white dashes.

Hindwing: smoky brown, white above cell, cilia leaden, white outwardly; underside the same, but a shade paler.

Underside forewing: smoky brown, with costal and ciliate marks repeated.

One ♂ specimen; Yuma Co., Ariz., desert, April 10th, received from J. B. Smith.

Eucosma nonana sp. nov.

Expanse 24 mm.

Head and palpi white, shaded with black over the eyes and on the sides of the palpi; antenna pale fuscous; thorax white, heavily dotted with black at base of patagia; abdomen fuscous; legs whitish, banded and dusted with black.

Forewing: white, powdered with black and olivaceous scales. A dark shade runs through middle of wing from base to apex. Between inner third and middle of dorsum a white line goes obliquely outward to above middle of wing, it is bounded on the inside by a line of black scales; on each side of it there is a short line of black in the fold. There is a row of black dots on outer half of dorsum. The costa is sparsely marked with small black dots and dashes its whole length. The ocellic spot is obscure, defined on inner side by a short vertical bar of shining whitish scales. Cilia white, fuscous at apex and several streaks of fuscous and black scales below apex.

Hindwing: light smoky fuscous, white above cell, cilia whitish; underside pale gray, a few black dots below costa and in apex.

Underside forewing: smoky fuscous, whitish on costa, dotted with brown, white below fold.

One specimen, Pueblo, Colo., H. W. Nash.

Eucosma popana sp. nov.

Expanse 15-18.5 mm.

Head, palpi and thorax white, dotted with black; a spot of black on upper side towards base and outside towards apex of second joint of palpi; antenna whitish; abdomen whitish, anal tuft cinereous; legs pale gray, dusted with brown.

Forewing: white, with fascia and spots of blackish-brown. An oblique fascia from inner third of dorsum to middle of wing, between it and base several wavy lines from dorsum to middle. At anal angle a triangular spot with its apex above middle. An oblique shade below costa to middle, over end of cell; a spur from its outer end joins another shade which runs below costal marks and into apex. Before apex, in outer half, are four triangular costal spots, on inner half of costa numerous small dots. The dark spots are all of blackish scales tippped with white; giving them a speckled appearance. Ocellic spot shining cream color, divided by a narrow brown vertical line, from its upper edge a narrow white line follows termen to apex. Cilia speckled white and black.

Hindwing: pale fuscous, darker at apex, cilia paler, underside the same.

Underside forewing: darker fuscous, whitish on costa, with dark costal marks repeated.

Twenty-seven specimens; Stockton, Utah, June 1st to Aug. 8th; collected by Tom Spalding.

Eucosma rorana sp. nov.

Expanse 15-20 mm.

Head: clay-yellow, a streak of light brown across the middle; palpi clay-yellow, a spot of fuscous above on outside of tuft and at end of tuft below, apical joint fuscous; antenna whitish; thorax white, mottled with light brown; abdomen fuscous, anal tuft clay-yellow; legs whitish, dusted and banded with black.

Forewing: white, with bands and spots of blackish-brown. The extreme base is white, strigulated with brown, merging into dark brown at its outer edge, which is obsolete on costa, extends nearly to inner third at middle in the form of a rounded spot, and to inner fourth on dorsum as another spot, the two being separated by a pale shade. There is a well-defined dark fascia from midddle of costa to dorsum before angle, it is deeply indented, by the intervening white fascia, on its inner edge a third above dorsum. Beyond it is the ocellic spot which is a well-defined rectangle of shining cream-white scales, divided by a dark vertical line and two black lines above. Costa before middle is marked with short dashes of brown and white; beyond middle, with four geminate oblique white lines on brown ground, the inner pair of lines end under the beginning of a third pair, the second and third pair unite and end under the fourth pair. Cilia speckled brown on white.

Hindwing: smoky fuscous, cilia paler, beneath the same but a spade paler.

Underside forewing: darker smoky fuscous, costal marks repeated.

Six specimens; Stockton, Utah, June 29th to July 3d; Tom Spalding.

Eucosma sosana sp. nov.

Expanse 16–19 mm.

Head, antenna and palpi pale clay-yellow, latter dusted with a shade darker externally; thorax clay-yellow, atomized with pale fuscous; abdomen and legs clay-yellow, latter banded and dusted with brown.

Forewing: clay-yellow, with basal area, one broad fascia and a shade on upper third of wing of a light olivaceous fuscous. This darker color is nearly uniform wherever it occurs, and is composed of olivaceous fuscous scales, with clay-yellow tips, giving an atomized or powdered appearance. The upper third of wing is of this darker shade, interrupted on the inner half of costa by five or six clay-yellow geminate dashes, those close to base are somewhat obscure, and in the outer half of costa by four strongly-defined clay-yellow geminate dashes; the dark shade between these outer dashes are somewhat ochreous below the costa; the outer dash of the second pair and inner dash of the third pair join together below costa and form a V, the lower point is tipped with golden-metallic scales; the outer dash of the third pair is prolonged beneath the fourth pair, and its lower half is leaden-metallic. From the middle of the dorsal margin a broad fascia of clay-yellow, slightly oblique, extends to upper third of wing, it is broader on dorsum than above, a horizontal line of yellow leaves it near upper end and lies below the first and second pair of geminate streaks in outer half of costa. The ocellic spot is large, clay-yellow scales, slightly shining, with in some specimens a horizontal black dash in middle and another near upper edge, two black dots occur on before the upper end of ocellic spot in other specimens. Cilia fuscous outwardly, speckled within.

Hindwing: light brownish-fuscous, cilia whitish fuscous; underside grayish, shaded with light brownish-fuscous below costa.

Underside forewing: smoky brown, costal spots repeated, yellowish before termen, with very dark terminal line.

Eight specimens; Stockton, Utah, May 23d to Aug. 2d; collected by Tom Spalding.

Eucosma totana sp. nov.

Expanse 14–19 mm.

Head, palpi, antenna, thorax, abdomen and legs ashy-white, outside of palpi shaded with pale fuscous, and dots of the same color on patagia, legs banded and powdered with pale fuscous.

Forewing: ashy-gray, lightly marked with brown shades, varying from light brown to blackish-brown. There is a dark shade through middle of wing, angulated at inner third obliquely inward toward dorsum, and forming the outer edge of basal area, but only defined in the middle of wing; a few dark dots connect this shade along middle of wing with a similar dark shade between end of cell and termen above middle of wing. The ocellic spot is concolorous, but with shining scales on sides and two or three black horizontal lines; before this spot on dorsum, and outlining it internally, is a small triangular dark spot. On the male costal fold are four or five dark dashes, between the fold and middle, two or three dark lines, one of which is as long as a third the width of wing; beyond the middle are three large dark spots, between each two a slender dark line; an oblique dark dash is in the apex. There are several dark dots below fold on internal third. Cilia white, dotted with gray internally and externally.

Hindwing: pale fuscous, cilia whitish; underside the same, with a few fuscous dots in apex.

Underside forewing: darker, brownish-fuscous, with costal spots repeated and a pale line before the darker terminal line.

Five specimens: Stockton, Utah, July 1st to Sept. 1st, Tom Spalding; South Utah, July, O. C. Poling.

Eucosma vovana sp. nov.

Expanse 16–23 mm.

Head: pale clay-yellow, with a few brown scales over eyes and in front; palpi cream-white, with two brown spots on side of brush above, outward end of brush more or less tinged with fuscous, apical joint black, with a tiny dot of whitish at extreme end; thorax white, with two brownish mottlings across front and middle; base of patagia dark brown; abdomen and legs pale yellowish-white, latter banded and dusted with brown; antenna white, finely ringed with dark brown.

Forewing: white; the markings are blackish-brown. There is a strigulation of dark scales in the base succeeded by a narrow white fascia, beyond which is a wider dark fascia, the outer edge of which starts from inner fourth of costa and is slightly oblique to fold, it broadens at fold and is then straight to dorsum; beyond it is a white fascia of about equal width, sharply defined inwardly. In the middle of costa is an oblong dark spot, its lower end reaching to middle of wing, beyond it, covering end of cell in middle of wing, is a rounded dark spot, below the latter on dorsal margin is a pair of rounded spots; these spots form a dark fascia from middle of costa to dorsal margin before the ocellus, but they are separated by white extensions of the white fascia before them. There is a wavy narrower dark fascia from costa at outer fifth to middle of termen.

Beyond the base in each of the white and dark fasciæ are three dark dashes on costa, and on the outer half are three large dark spots and as many narrow ones, with a large one in apex. The ocellus is white, with a few shining scales at side and two black dots on inner edge. The dark fascia and spots are usually outlined in blackish-brown, with strigulations of the same color, on a paler brown ground. Cilia white, preceded by a gray line, and with the gray cutting into apex and below apex.

Hindwing: pale fuscous, cilia a shade paler; underside the same.

Underside forewing: smoky fuscous, costal spots repeated.

Thirteen specimens: Stockton, Utah, Aug. 2d to Sept. 3d, Tom Spalding; Bear Creek, Morrison, Colo., E. J. Oslar; Yuma Co., Ariz., desert, March 26th, from J. B. Smith; Glenwood Springs, Colo., Aug. 24th, Dr. Barnes; Amarillo, Tex., Aug. 30th, Cockerell.

Cotype in U. S. Nat. Mus.

This species is close to *E. shastana* Wlsm. and *E. biquadrana* Wlsm.

Eucosma subinvicta sp. nov.

Expanse 30 mm.

Head and thorax creamy-white, patagia pure white; palpi creamy-white, dusted with fuscous externally; antenna yellowish-white; abdomen light gray, tuft ochreous-gray; legs white, dusted with brownish-fuscous.

Forewing: pure white, this ground color occurs in a broad fascia in middle of wing from dorsal margin to above middle, it narrows above the middle of wing and the upper third is overlaid with fuscous strigulations from costa; there is a white patch on dorsum at base below fold. There is an obscure fuscous fascia from inner fourth of costa, curving inward below middle to inner fifth of dorsum, it is marked in the middle of wing by a dentate line of black-brown scales. A fuscous fascia crosses wing from beyond middle of costa to dorsal margin, its inner edge is obliquely outward to middle of wing, then slightly inward to dorsum, it covers the outer third of dorsum. Beyond it on costa is a white patch in which are three dark brown dots, and a larger one in apex, between each two is a tiny brown dash. The ocellus is large, covering the area between the dark fascia and termen, it is mottled white and fuscous, with several small clusters of black scales on the inner side; above it are two curious characters in black and brown scales, the outer like the small letter h, and the inner like an inverted L. The cilia is mottled brown and fuscous.

Hindwing: whitish-brown, darker at apex; cilia white, with an outer and inner fuscous line; underside whitish, streaked with fuscous below costa, from base to apex.

Underside forewing: mottled white and fuscous, principally white below fold, costal dots repeated, cilia preceded by a white line and white dashes at veins 1*b* and 4.

Williams, Ariz.

Type in my collection; other specimens in U. S. Nat. Mus.

These specimens in the National Museum have been incorrectly identified as *E. invicta* Wlsm. While their general appearance is similar, they can easily be separated by the Indian-red head and palpi of *invicta*. Have thirteen specimens of the latter.

Eucosma palousana sp. nov.

Expanse 20–24 mm.

Head and thorax very pale ochre. Palpi same internally stained with fuscous on outsides; tuft on second joint long and loosely scaled, extending beyond apex below and concealing outer joint, except the extreme tip visible from above; length beyond head a little more than the thickness of head. Antennæ white, annulated with fuscous. Abdomen whitish, end of anal tuft stained with light fuscous. Legs pale ochreous.

Forewing: costa very slightly arched; apex shortly rounded; termen straight from 7 to 3; male costal fold, less than a quarter, narrow, appressed, scales roughened.

Color: very pale ochreous, with basal and dorsal spots and streaks on costa and in apical portion of a light brownish-ochreous. On dorsum, one quarter from base, a narrow fascia arises, continuing obliquely with parallel sides to upper edge of cell; the basal area enclosed is ground color, and beyond this semi-fascia is a broad band of ground color, outwardly defined on lower half by a brown spot on dorsum before angle, this spot is broadest on dorsum and has a hump above on its outer half, altogether about one-third of width of wing. The costal fold is brown, sprinkled with fuscous; the costa beyond fold is evenly marked with about fifteen light brown spots, the three or four before middle are short

oblique dashes; at the middle the dash continues obliquely to top of cell; in the outer third the streaks continue obliquely across the wing, the inner one to the anal angle, but very often broken; the second beyond this is enlarged into a flattened subapical spot, then continuing as a line into termen above angle; above and beyond this the streak before apex crosses to termen below apex. In the apex is a rather large spot, darker than any of the costal dashes. Ocellic patch illy defined; a rather large irregular area of shining ochreish scales, enclosing a brown spot, in the center of which are two dark brown dots, vertical to each other. The pale ground color is more or less strigulated with the darker shade of brown. Cilia ground color, heavily dotted with darker fuscous, with a whiter streak above middle, above and behind angle.

Hindwing: light smoky fuscous, cilia paler; underside same but lighter.

Underside forewing: light cinereous-fuscous, a large dark fuscous apical spot. Cilia dirty fuscous.

Five specimens; Pullman, Wash., July 11th, Aug. 10th, and Sept. 18th. One bearing label "Wash. Exp. Sta. No. 533; collected by C. V. Piper; and five specimens, Los Angeles, Cal., Aug. and Oct., "Through C. V. Riley." These last five are much more heavily overlaid with dark brown; they are also larger, the females expanding 24 mm. and males 20 mm.

Cotype in U. S. Nat. Mus.

Eucosma immaculana sp. nov.

Expanse, ♂, 26–28 mm.; ♀, 22–27 mm.

Head, palpi, thorax, forewings above, abdomen and legs very light ochreish, with a pinkish tinge. The pink shade is more intense on outside of palpi, front surfaces of anterior legs and around eyes. Palpi with rather long scales projecting in front of apex below, the point of which is only visible from above and projecting nearly twice thickness of head beyond it; very moderate crest on head.

Forewing: including cilia pale pinkish-ochraceous. Male costal fold narrow, appressed, about one-fifth length of wing, rather a darker shade of pink than balance of wing, with a narrow costal shade of ochreous, this streak extending almost to apex along extreme edge of costa. No marks, lines or dashes either on wing or costa.

Hindwing: light ochreish-fuscous, cilia bleached straw color.

Forewing beneath: shining light yellowish-fuscous, cilia paler and stained with pink at apex and below middle.

Underside hindwing: same color but a shade paler.

Four specimens: two male and three female; Pullman, Wash., Aug. 9th to 24th; collected by C. V. Piper. One specimen bears an extra label reading "Wash. Exp. Sta. No. 515."

Cotype in U. S. Nat. Mus.

The shape of the wings of this species and the general structural appearance is like *Eucosma crambitana* Wlsm., and I would place it in the list following the group with silver or white bars.

Eucosma johnsonana sp. nov.

Expanse 14–15 mm.

Head: with compact tuft between eyes and projecting forward, rounded on top, scales of moderate length; color dull ochre, suffused with pink back of and beneath eyes. Palpi with flattened compressed tuft on top largest about middle of second joints, thence rounded to outer joint, the tip of which is well exposed; color: salmon-pink, outer joint darker and tipped with ochre. Antennæ simple in male and female, grayish-fuscous, suffused with pink, annulations darker. Thorax and patagia salmon-pink, fading into ochreous posteriorly. Abdomen and legs pale ochreish, anterior tibia pink in front.

Forewing: costa nearly straight, very slightly and evenly arched, apex rounded, termen straight to 3, angle rounded, dorsum straight. Male costal fold little more than one-third length of ring, narrow, appressed. Pale ochreish, shaded with salmon-pink along costa, and a well-defined basal patch of this color. The basal patch of pink is most pronounced on dorsal half of wing and extends to beyond inner third, it is outwardly defined by a narrow band of very dark brown and black scales from dorsal margin to middle of wing, slightly oblique inwardly (*i. e.* nearer base at middle that at dorsum). A well-defined band of pink from base to apex on costa and extending down to upper vein of cell and following line of 7 into apex. A triangular shade of ochreish-pink is below this band in outer half; this shade is continued as a narrow line curving above ocellic spot and enlarging on termen, between apex and ocellic spot, into a smaller triangular spot. Ocellic spot large, rounded, occupying half width of wing; pale ochreish, crossed by three slightly shining, whitish, vertical lines, the outer curves inward at the top and there joins the inner. A few blackish scales on the lower ends of each of these lines, and a few scattered blackish scales above ocellic spot. Cilia very pale ochreish, with a double line of black scales from below apex to above anal angle. The costa is not marked with any distinct lines, but it as well as the whole of the wing is very faintly mottled with scales slightly darker or slightly lighter than the prevailing shades. In female specimens the blackish dorsal semi-fascia is broader and there are more separate black scales in the ocellic patch and above it.

Hindwing: whitish-fuscous, shading into smoky fuscous at apex and termen. Cilia white, preceded by a dark fuscous, then by a narrow whitish line.

Forewing: beneath fuscous, pink along costa, whitish below cell and 2, cilia gray.

Hindwing: beneath pale fuscous or light gray, cilia whitish.

Five specimens: one female, Seattle, Wash., red ink number 27; collected by O. B. Johnson; one female, Victoria, B. C., Rev. Geo. W. Taylor; one male and one female, Henry Edwards' collection, No. 14,720, and bearing small labels "3844 Nevada"; one male, Henry Edwards' collection, Vancouver Island.

Cotypes in U. S. Nat. Mus. and Amer. Mus. Nat. Hist.

Eucosma hopkinsana sp. nov.

Expanse 14.5–17 mm.

Head, palpi and thorax pale greenish. Head with flattened tuft or crown, above eyes and smaller tuft above face between base of antennæ; a few darker fuscous scales on top of head. Palpi: tufts flattened, compressed, moderate,

speckled with black, except on inner sides; outer joint half as long as second, exposed, dark at base. Antennæ slightly dentate, whitish-green, annulated with black. Thorax more of a solid pale green, patagia whitish green. Abdomen light fuscous, segments darker anteriorly, anal tuft cinereous. Legs light gray or pale fuscous, marked with blackish-brown on anterior tibia, annulations on anterior tarsi and a spot of same on posterior tibial tufts.

Forewing: costa slightly and evenly arched, male costal fold nearly half length of wing, moderate in width. Apex rounded, termen slightly concave between 3 and 7; dorsum slightly rounded. Color: whitish-gray, overlaid with shades and lines of pale green, fuscous and black. A median spot of black at base with green center; an oblique black dash on inner third of dorsum to middle, defining basal area, above it, obliquely inwardly, a shade of greenish fuscous, not reaching costa; a quadrate dark spot on dorsum before angle, this spot is slightly oblique, is outlined inwardly and outwardly with black, between these lines it is mottled green, whitish and gray. Between this spot and inner dorsal dash the ground color is paler and forms a light fascia on lower half, but not defined above middle. Costal fold marked with eight inwardly oblique short black dashes. Beyond fold, costa is marked with four quadrate dark spots, each outlined with black and greenish between the black lines, the third spot before apex sends an oblique black line into termen below apex, and an oblique line of the same color from inner spot obliquely to dorsal quadrate spot. A preciliate row of five greenish spots, each outwardly outlined with black. A cluster of green scales above dorsum in pale fascia between the two dark dorsal spots and a similar cluster above ocellic space. The ocellic spot is not defined. An obscure, inwardly-oblique, blackish shade from costa spot before apex towards quadrate spot on dorsum, ending abruptly at vein 7, and separated from the dorsal spot by ground color. In very strongly marked specimens, no doubt these spots may appear as a blackish, interrupted fascia. Dorsal margin marked with seven or eight spots of fuscous, greenish and black. Cilia long, gray, speckled with fuscous.

Hindwing: cinereous gray, darker at apex and before termen, cilia paler.

Forewing: beneath blackish-fuscous, streaked with gray along costa and termen, cilia gray, with five or six small round dark gray dots.

Underside hindwing: pale shining gray, cilia same. This description is principally from the female, in which the black lines and scales are the more pronounced than in the males, the black of the female is more of a dark fuscous, and there are more of the greenish scales scattered over the ground color. There seems to be no difference in the position and shape of spots, lines and fascia.

One male, one female: Hoquiam, Wash.; bred from *Picea sitchensis*; breeding labels "2119a. Hopk., U. S." and 40,370[1] Hopk. U. S.;" Burke, collector. The food plant label of the first bears an ? mark. One male, same locality and collector, labelled "July 21, 1904, flying."

Cotype in U. S. Nat. Mus.

Thiodia radiatana Wlsm. and allied species.

The little group of species, including *radiatana* Wlsm., *formosana* Clem., *ferruginana* Fern., and *aspidiscana* Hbn. have been hopelessly

mixed in every collection I have seen, which is partly accounted for by reason of the fact that the females are usually so unlike the males that it has been easier to refer them to another species than to associate them together. I have been successful in accumulating very long series of both sexes of each species, including four new species which are described below, and the following notes will doubtless be helpful in arranging them hereafter. For the purpose of comparison the males and females are treated under different heads.

T. radiatana Wlsm. ♂.—Forewing: whitish-fawn color, with a brown-ochreish streak from base to termen below apex, the veins beyond cell outlined with the same color, ocellus not well developed.

Hindwing: light fuscous-brown.

T. essexana Kearf. ♂.—Forewing: paler than *radiatana*, more of a bleached straw color, median brown streak darker, veins beyond cell not distinctly outlined with brown, ocellic spot well defined and encircled by brown.

Hindwing: gray fuscous.

T. umbrastriana Kearf. ♂.—Forewing: a shade darker than *radiatana*, median streak obscure, the entire outer third suffused with brown-ochreish, except the costal spot area, ocellus not strongly defined.

Hindwing: dark smoky brown.

T. roseoterminana Kearf. ♂.—Forewing: similar to *umbristriana*, but a paler brighter color, median streak nearly or quite obsolete, suffusion in outer third of a bright burnt-sienna shade, ocellus not distinct.

Hindwing: paler than *umbristriana*, or the same shade as *radiatana*.

T. awemeana Kearf. ♂.—Forewing: like a diminutive *distinctana*, but darker, median streak broader and to middle of wing only.

Hindwing: light fuscous brown, similar to *radiatana*.

T. ferruginana Fern. ♂.—Forewing: reddish-ochreous, paler at base. This is the smallest in both sexes of the series.

T. formosana Clem. ♂.—Forewing: inner two-thirds blackish-brown, outer third ochreous, costal metallic streaks do not connect with ocellus.

Hindwing: dark smoky brown.

T. aspidieana Hbn. ♂.—Forewing: similar to *formosana*, but less ochreous in outer third, and a strong metallic line from costa to inner metallic bar of ocellus. I have five European specimens of this species, the name of which has been so frequently applied to American specimens, I think erroneously, as I have never seen an American specimen having all of the characters common to the European.

T. radiatana Wlsm. ♀.—Forewing: brownish-ochreous, with the median streak of a darker brown, ocellus not distinct.

Hindwing: darker brown.

T. essexana Kearf. ♀.—Forewing: inner third brownish ochreous, outer third darker brown, ciliate edge gray, ocellus much more distinct than in *radiatana*.

Hindwing: reddish-brown, lighter and brighter than *radiatana*.

T. umbrastriana Kearf. ♀.—Forewing: lighter ochreous-brown than either of the above two, cilia ochreous.

Hindwing: as dark as *radiatana*.

T. roseoterminana Kearf. ♀.—Forewing: darker than *umbristriana*.

Hindwing: darker, cilia more ochreous.

T. awemeana Kearf. ♀.—Forewing: very much like ♂ *formosana*.

Hindwing: darker than any of the preceding, cilia whitish.

T. ferruginana Fern. ♀.—Forewing and hindwing: very little different from its male.

T. aspidiscana Hbn. ♀.—Forewing: like the male, hindwing much darker.

The most common mistake in identification has been to name all of the pale fawn or straw-colored males as *radiatana* and all of the reddish females as *ferruginana*, notwithstanding they are nearly double the size of the latter; and sometimes the females of *radiatana* have been named as female *formosana*. *Formosana*, in its turn, or, more frequently, the males, are usually named *aspidiscana*.

Thiodia essexana sp. nov.

♂.—Expanse 20–26 mm.

Head and palpi speckled gray, latter paler internally; thorax pale straw, with brown central and lateral streaks, patagia brown; antenna light grayish fuscous; abdomen fuscous, anal tuft paler; legs ochreous-gray, dusted with brown.

Forewing: bleached straw color, with a brown streak from base near dorsum to outer margin, it spreads there and circles the ocellus on its outer and lower edge, terminating in a large spot on dorsum before ocellus; from its outer end a spur goes up into apex. The ocellus is nearly round, and its pale straw color, well defined by the brown which surrounds it on all sides, except a small distance on its inner edge, where it connects with the same shade of the lower third of wing; the scales on the sides of the ocellic spot are slightly shining, and it is shaded with slightly darker scales over the veins which are beneath it. The outer two-fifths of costa contains three light brown dashes, outlined by paler, somewhat shining straw color lines, running together in a line parallel to costa, and concave above the ocellic spot. Cilia shining leaden-gray, with an internal line speckled fuscous and gray.

Hindwing: grayish-fuscous, darker around edges, cilia whitish-fuscous, with a dark basal line and a darker intermediate line; underside: ochreous-fuscous, dashes below costa and terminal line.

Underside forewing: coppery-fuscous, fawn along costa and gray along termen, straw color below fold.

♀.—Expanse 17–22 mm.

Forewing: brownish or dark reddish-ochreous, a slightly darker median shade from base running into the blackish-brown shade, which covers the outer third. Ocellic spot: of two curved bars of shining leaden scales, shaped as two halves of a circle but open top and bottom. Costal spots absent, but the boundary lines of shining leaden present, with a few scales of same color in middle of termen. Cilia dark brown and shining fuscous, preceded by a line of gray scales.

Hindwing: reddish- or Indian-brown, with a coppery reflection, darker around edges, cilia paler, with a darker basal line.

Twelve ♂ and six ♀ specimens, all collected near Caldwell, N. J. I have also bred this species from larvæ living in the main stem of *Aster patens* throughout the winter.*

Thiodia umbrastriana sp. nov.

♂.—Expanse 16–18 mm.

Head: pale fawn color, mixed with brown scales, thorax the same, with brown central and lateral lines, patagia paler; palpi gray, whitish internally; antenna pale fawn, darker at base; abdomen shining fuscous, anal tuft fawn; legs whitish-fawn, dusted with brown.

Forewing: light ochreous, straw color, with a diffused median streak of pale umber from base to outer third, where it joins the shade of the same color covering outer third of wing. The ocellus consists of a double bar of leaden scales, joined below in shape of U. The costal lines are not distinct as in the preceding species, and a streak of the ground color runs above the dark shade nearly to apex but towards its outer end becomes brown. Cilia ochreous-fuscous, preceded by a line of gray and black dots.

Hindwing: smoky fuscous, cilia whitish, preceded by a darker line; underside shining ochreous-white.

Underside forewing: brownish-ochreous, paler along costa and a darker shade in upper half of cell.

♀.—Expanse 16–18 mm.

Head: as in male but darker, and containing gray scales; palpi, thorax and legs darker.

Forewing: similar to male, but very much darker and more clouded with the umber color, which is not confined to outer third.

Hindwing: dark coppery smoky brown; cilia ochreous-brown, preceded by a darker line.

Eighteen ♂ and five ♀ specimens: Aweme, Man., June 9th to 22d, Criddle; Cincinnati, Ohio, May 23d to June 6th, Miss Braun; Beaver Co., Pa., F. A. Merrick.

Thiodia roseoterminana sp. nov.

♂.—Expanse 17.5–21 mm.

Head: grayish-brown; palpi gray, whitish internally; thorax pale fawn, darker in front and behind, patagia darker at base; antenna grayish-fuscous; abdomen yellowish-fuscous, tuft paler; legs pale fawn, dusted with darker.

* Recorded in Journal of New York Entomological Society, Vol. XI, Sept., 1903, p. 159, as *T. radiatana* owing to a wrong determination.

Forewing: inner two-thirds very pale whitish-fawn, median streak almost obsolete, outer third of a rosy-coppery hue; a shade of darker fawn below costa in outer third, in which the costal spots and lines are but faintly observable. The ocellus is nearly obsolete, a shade of fawn, hardly differing from the color around it, enclosed on both sides with faintly metallic bars, with a pinkish tinge. Cilia light pinkish-brown.

Hindwing: light smoky brown, cilia paler, preceded by a darker line; underside whitish-ochreous.

Underside forewing: pale ochreous-brown.

♀.—Expanse 16–19 mm.

Head and thorax reddish-brown; palpi dark gray, whitish internally; antenna and abdomen reddish-fuscous; legs ochreous, dusted with brown.

Forewing: very like female of *umbrastriana*, but of a brighter ochreous-red.

Hindwing: dark smoky brown; cilia ochreous, preceded by a darker line; underside reddish-ochreous.

Underside forewing: dark smoky ochreous-brown, paler along costa.

Twenty eight ♂ and twelve ♀ specimens: Cincinnati, Ohio, May 19th to 29th, Miss Braun; New Brighton, Beaver Co., Pa., May 18th to June 3d, F. A. Merrick; Wisconsin.

Thiodia awemeana sp. nov.

♂.—Expanse 17–19 mm.

Head: pale fawn, with ashy-gray scales in tuft above eyes and front; thorax pale fawn, with a blackish central and lateral line; patagia fuscous at base; palpi fuscous-gray, paler within; abdomen grayish-fuscous; legs fawn, dusted with brown.

Forewing: very pale fawn, median streak blackish brown, from base at dorsum to fold at middle of wing; outer third of wing, surrounding ocellic spot, dark brown, overlaid with black. Ocellic spot fawn, with metallic side bars, joined below; costal spots fawn, costal lines shining pale fawn, before apex a metallic line, becoming leaden below, parallels the termen to middle of wing. A shade of the dark outer color reaches costa before the costal lines and forms a narrow darker fascia to anal angle. Cilia blackish-fuscous, divided by a pale fawn line and a narrower pale basal line.

Hindwing: light brownish-fuscous, darker at apex; underside pale gray.

Underside forewing: grayish-brown, lighter on outer half of costa.

♀.—Expanse 17–19 mm.

Marked similar to male, but very much darker, not reddish as in the females of the three preceding species. The outer third is dark ochreous and dark brown, overlaid with black. The metallic leaden line from before apex joins the outer bar of ocellus. The light fawn of inner two-thirds is heavily overlaid with brown. Cilia blackish-fuscous; underside blackish-brown, ochreous-brown along costa.

Underside forewing: same as hindwing.

Eleven ♂ and two ♀ specimens: Aweme, Man., May 20th to June 29th, Norman Criddle; Beulah, Mann., A. J. Dennis.

Thiodia annetteana sp. nov.

Expanse 14-16 mm.

Head, palpi and thorax yellowish-fawn; antenna brown; abdomen light fuscous, legs whitish-yellow, dusted with fuscous.

Forewing: inner half dull yellow. The outer half is occupied by an elaborate ocellic spot, with metallic lines from costa. The ocellus is circular, filling the outer fourth of wing, on the lower half are two horizontal rows of square black spots, with a trace of a third line below, the upper half is brownish-fuscous, speckled with whitish scales. A silvery-metallic line in the form of a half circle bounds the upper half, it is interrupted at highest point, where a short metallic line from costa connects with the innerside; the outerside ends in middle of termen, where it nearly joins a vertical metallic line from apex. There is a vertical curved line on inner side of lower half of ocellus, and a shorter line on the outside, with a short one between the two middle pairs of black dots; the two former of these roughly form a complete circle around the ocellus. Beyond middle of costa a metallic line crosses the wing vertically, reaching nearly to dorsum, a similar but shorter line starts from costa behind the first one, but only reaches middle of wing; these two lines form the inner boundary of the ocellic ornamentation, between the lines and above the upper metallic circle the color is same as inner half of wing, but dotted heavily with gray along the edges. Cilia speckled fuscous and gray at base, outwardly shining gray; underside gilvery-gray.

Underside forewing: light coppery-brown, costal spots faintly repeated.

Seven specimens: Cincinnati, Ohio, April 2d to 23d, all collected by Miss Annette F. Braun, whose name will fittingly honor this dainty species. It is closely allied to *T. refusana* Walk., and closely resembles *Eucosma circulana* Hbn.

Thiodia asphodelana sp. nov.

Expanse 25–30 mm.

Head and palpi brownish-gray; antenna silvery-gray; thorax gray, finely speckled with fuscous; abdomen grayish-fuscous, tuft cinereous; legs gray, banded and dusted with fuscous.

Forewing: light brownish-fuscous, the outer half of the rather long overlapping scales ashy-white, giving the wing a frosted appearance. The white scales are not as abundant below the middle of the wing, causing a darker shade which crosses fold and ends before ocellus. The latter is high up in middle of termen and consists of two or three short vertical lines of irridescent scales, bounded on the outside by three black dots. The costal marks are obsolete, but below costa, above ocellus, are a few irridescent scales, arranged as would be the ends of oblique costal lines. On the border, below apex, is a short line of shining scales; terminal line brown; cilia whitish-fuscous, with a white line at base, followed by a darker line.

Hingwing: smoky brown, cilia white, with white followed by brown basal lines; underside the same, but a shade paler, and whitish along costa; underside very dark, smoky brown, whitish along costa and termen.

Four specimens: Durango, Colo., June 6th and July 2d, Dr. Dietz; South Utah, July, O. C. Poling; Calgary, Alberta, Head of

Pine Creek, July 2d, F. H. Wolley Dod, through Dr. Fletcher. This last specimen also bears label "Crambid fide Smith, Dup. of 36 to him Feb. 1900."

Thiodia baracana sp. nov.

Expanse 15–19 mm.

Head: light brown on sides, whitish-brown above and in front; palpi former shade outside, latter shade within; antenna creamy-white; thorax light brown, a spot of white on base of patagia, and a circle of white on posterior end; abdomen yellowish-white; legs yellowish-white, dusted with brown.

Forewing: basal area extending beyond fourth, outer edge vertical, straight, except one indentation below fold, mottled light brown, darker in outer half and edged with dark brown. It is followed by a broad white fascia, the inner half of which reaches costa; a third below it broadens horizontally, equaling the width of basal area, thence in a dentate line to dorsal margin. This is followed by a light brown fascia, well defined on lower two-thirds of wing; in the upper third it runs obliquely inward to costa, and on inner edge below costa sends a short line into the white at its narrowest part; there is a dot of raised black scales on its inner edge just above fold; the width of this brown fascia is equal to width of the white ocellic patch beyond, the latter is large, with straight vertical edges, and reaches to upper third of wing, it is dull white in the middle and shining white on the sides, between its upper half and termen is a wedge-shaped brown streak. The outer half of costa is marked with three brown spots, increasing in size outwardly and a fourth brown spot in apex, before the first and between each pair is a broader white spot, divided by a narrow brown oblique line. Between these costal spots and the upper edges of the brown and white fasciæ is a horizontal strigulation of gray and lilaceous-metallic lines. Antenna white, speckled with fuscous and brown on upper half.

Hindwing: light pinkish-gray, cilia white, with a darker basal line; underside the same.

Underside forewing: light smoky fuscous, costal spots repeated.

Six specimens: Stockton, Utah, Aug. 21st and Sept. 5th, Tom Spalding; Denver, Colo., Oslar; Colorado, Nos. 2133 and 2147, Gillette.

Cotype in U. S. Nat. Mus.

Thiodia caracana sp. nov.

Expanse 18–22 mm.

Head and palpi fawn-brown, latter paler within; antenna grayish-fuscous; thorax fawn-brown, with a patch of white on posterior end; thorax cinereous, tuft yellowish; legs whitish, banded and dusted with blackish-brown.

Forewing: brown, mottled with gray and white; two large square white dorsal spots, one in middle of wing, reaching to upper third, dentate on inner edge, an outer spur on fold from outer edge; the outer white spot is a little narrower than the inner and is in ocellic space, with straight vertical edges, it contains two or three black dots and a small patch of grayish scales, with a brown centre in upper part. The brown patch separating these white spots is dotted with white,

gray and black, especially black along the edges. Before the middle spot the outer half of the dark basal area is similarly dotted with black. The costa is marked with fine white lines its extire length, there are six in the basal area, four over the middle dorsal white spot, beyond these are four pairs of geminate white lines, becoming shining gray below costa and obliquely extending to the upper edges of the two outer dark and white dorsal patches, the gray streaks are on an obscure dark brown ground. The geminate streaks are separated by clear brown wedge-shaped streaks, the widest separating the outer geminate lines from a brown lunate apical spot, the latter is separated by the outer end of a costal line, with a similar brown streak between ocellic spot and termen. Cilia white at angle, with a fine marginal gray and brown line, which increases above middle and overspreads the cilia, becoming smoky black at apex.

Hindwing: light shining fuscous, cilia paler; underside the same on lower half, becoming much darker above.

Underside forewing: smoky brown, with white geminate costal spots.

Five specimens: Denver, Colo., Aug. 3d and 6th, A. J. Oslar; Stockton, Utah, June 29th, Tom Spalding; Pueblo, Colo., Aug., H. W. Nash.

Thiodia daracana sp. nov.

Expanse 16–18 mm.

Head: blackish-brown over eyes, cinereous above and in front; palpi grayish-brown; antenna and thorax fuscous; abdomen fuscous, anal tuft yellowish; legs brownish-white, dusted and banded with shades of darker brown.

Forewing: fuscous, heavily overlaid with white, giving a gray appearance. The white scales are closer together, forming an obscure fascia on lower half of wing beyond middle. The ocellic spot is white, with shining white scales on side, and two short superimposed horizontal black lines. Between middle and apex the costa is marked with five pairs of (geminate) lines, the three outer pairs run together beneath the subapical spot, sending a spur into termen beneath apex, below the costa these lines are slightly irridescent. The geminate lines are separated by darker fuscous-brown spots on costa, and there is a small triangular patch of the ground color, nearly free from white scale on dorsum below ocellus. Cilia gray, speckled with fuscous and with a narrow white outer line.

Hindwing: smoky brown, lighter above dorsal margin; underside grayish-fuscous, with a purplish reflection.

Underside forewing: fuscous, paler below.

Ten specimens: Placer Co., Cal., April 20th to May 1st, A. H. Vachell.

Thiodia raracana sp. nov.

Expanse 11–14 mm.

Head: cream-white, shaded with light brown on tufts above eyes; palpi cream-white, with a dot of fuscous at base and one at middle of second joint outside; antenna cream-white, shaded with fuscous in front; thorax salmon-pink, ochreous in front; abdomen fuscous, anal tuft pink; legs whitish, banded and dusted with brown and black.

Forewing: light reddish-ochreous in the brightest specimens to a reddish-fuscous in the darkest. The color is darker in the middle of the wing and palest below costa before middle and at apex. The ocellus is the most conspicuous marking, it reaches to middle of wing, and is as broad as high, cream-white in the middle, with vertical side bars shining white, on the dull white are two hori-

zontal black lines, sometimes joined at their outer ends and sometimes broken into dots, and occasionally with a dot or two below—the beginning of a third line. The costa is lightly marked with whitish oblique dashes, these beyond middle, five in number, are geminate, with faint leaden-metallic lines separating the two parts of each, from the middle one of the five a leaden line runs to similar shorter streak from spot before apex. The ground color between ocellus and these costal streaks is more ochraceous than pink. Cilia very pale fawn, becoming brown at apex and with a speckled row of gray at base.

Hindwing: shining grayish-fuscous, cilia the same; underside of both wings the same, forewing a shade darker.

Sixteen specimens: Montclair and Essex Co., N. J., Aug. 8th to 26th, with net and at light trap; Kentucky (Covington), Aug., A. Busck; Washington Co., Ark., July, A. J. Brown; Hastings, Fla., Oct., A. J. Brown. One specimen from U. S. Nat. Mus. labelled "Salidago, 11/884," and "From Glovers coll. 83."

Cotype in U. S. Nat. Mus.

This species has been incorrectly named as *Semasia ochreicostana* Wlsm. by Dr. Dyar, in my collection and others.

Proteopteryx laracana sp. nov.

Expanse 15-17.5 mm.

Head, palpi, antenna and thorax yellowish-gray, latter speckled with fuscous; abdomen and legs yellowish-gray, latter dusted and banded with dark brown.

Forewing: no male costal fold; shining whitish-gray, somewhat mottled with blackish-brown. There are two conspicuous blackish-brown characters, one a streak in middle of wing from base nearly to middle, the other a crescent-shaped fascia from middle of costa to middle of wing, then turning and running into apex. The basal streak widens below at about a quarter from base, and beyond its outer pointed end it sends a more or less obsolete fine line along fold to anal angle. The lower edge of the crescent mark reaches below middle of wing at outer third, its upper edge is dusted at the upward turn; in the gray area enclosed by the crescent, are four large brown costal spots and four fine brown lines. The inner third of costa is marked by three oblique brown lines. The dorsal edged from inner fourth to angle is marked with brown dots. In the darkest specimens the basal streak connects with the crescent, and the lobe on its lower side reaches to dorsum; the outer end of crescent is also enlarged and separated from the inner portion by a line of ground color. Cilia gray, preceded by two dark basal lines, a white dash below apex.

Hindwing: silvery-gray, cilia paler, underside the same.

Underside forewing: gray below middle, smoky brown above, costal marks repeated.

Thirteen specimens: Cincinnati, Ohio, March 27th to April 10th, Miss Braun; New Brighton, Pa., March 27th to April 15th, F. A. Merrick.

This is one of several species in Mr. Merrick's collection, incorrectly identified as *P. spoliana* Clem. by Dr. Dyar.

Proteopteryx maracana sp. nov.

Expanse 14–16.5 mm.

Head and palpi grayish-fuscous; antenna blackish; thorax black, patagia grayish-fuscous; abdomen blackish-fuscous; legs yellowish-white, heavily banded with blackish.

Forewing: without costal fold in the male, whitish-gray, with a well-defined basal area, outer fascia and spot in apex of black and brown. The basal patch is to inner fourth on costa and dorsum, and to inner third below middle of wing, above the middle the edge is lightly indented and irregular. There is a transverse shade of gray in the middle of the patch, defining a strong dentate dark process from middle of base. The dark fascia crosses wing between middle and outer third, its outer edge to anal angle, it is inwardly shaded with gray on upper fourth, with a black line on costa between the edges, a shade of brown crosses it at middle. The apical spot is an extension of the large costal spot before apex, it extends nearly to middle of wing in the shape of flattened triangle, with the long angle horizontal. Between the dark basal area and dark fascia is a grayish fascia, marked with two brown dashes on costa and a brownish-fuscous streak running through its middle to termen, enlarging into a brownish-yellow spot on lower half. The ocellus is yellowish-gray, containing a few black dots, the inner vertical bar is shining leaden, broad and large, the outer bar of the same color is narrower and shorter. Beyond the dark fascia the costa is marked with three large geminate grayish-white spots; that before apex sends a few whitish scales to termen below apex. Cilia gray inwardly, blackish outwardly.

Hindwing: light smoky brown, whitish above cell, cilia pale, with dark basal line; underside the same.

Underside forewing: smoky brown, costal spots repeated.

Seven specimens: Cincinnati, Ohio, March 26th to April 10th; all collected by Miss Annette F. Braun.

Proteopteryx haracana sp. nov.

Expanse 14–17 mm.

Head, palpi, antenna and thorax hoary, speckled blackish-brown; abdomen shining gray; legs whitish, banded and dusted with blackish.

Forewing: without costal fold in male; gray, with a smoky black streak from dorsum at base to apex, obliquely across wing. The inner part of this shade is the basal patch, which is only defined on lower half of wing, it is continued above middle by narrow angulated streak to apex. In one very dark specimen the black shade covers all of the lower two-thirds of wing, before the ocellus, with a few whitish scales, outwardly defining the basal patch. The costal third is gray, evenly spotted with blackish-brown, there are seven or eight large dashes and about as many fine lines. The ocellus is large, atomized white on dark ground, with four short horizontal short lines superimposed and a few dots of black below, the side bars are shining. Before the ocellus and in the apex are olivaceous shades. The apical spot is rounded, of an olivaceous shade, edged with black above, the black edging turning over and continuing as a black subterminal line as far as the incission. Cilia fuscous, speckled with black and white.

Hindwing: very light smoky gray, darker around termen, cilia paler, with darker basal line; underside shining light gray, dotted with fuscous on costa.

Underside forewing: smoky black, costal dots repeated.

Six specimens: Hunter's Range, Pike Co., Pa., May 1st; collected by Alfred E. Lister.

Proteopteryx faracana sp. nov.

Expanse 18–19 mm.

Head and palpi coppery-brown; antenna gray; thorax bronzy-gray, patagia streaked with white; abdomen gray, anal tuft light ochreous; legs whitish, dusted and banded with bronzy-black.

Forewing: no male costal fold, light bluish-gray, shaded with ochreous below costa at base. The basal area and other marks are bronzy-black. The basal area is strongest below middle, where its outer edge touches dorsum at inner fourth and outer end at inner third in middle of wing. The lower half between basal patch and ocellus is bronzy-black, crossed by two horizontal whitish-gray lines, one on the fold and the other half way between fold and dorsum. From inner fourth of wing a streak of bronzy-black parallels costa one-third below to before apex. Above this streak is bluish-gray, crossed at inner fourth, middle and outer third by dark lines from costa, which run into the dark streak below. Between these the costa is dotted with short dark dashes. The three dark costal dashes before apex send strigulated lines, the inner, in connection with the ocellic black dots, as a continuous line to anal angle, the middle one to middle of dorsum, the outer one curves under apex. The apical spot is black, with brown center. The ocellic spot is large, shining gray on the sides, dirty white in center, with a vertical line of black dots. Between the ocellus and termen is a narrow band of speckled gray and brown, increasing in width above middle and running into apical spot. Cilia shining leaden.

Hindwing: light grayish-brown, cilia whitish, with darker basal line; underside the same, mottled with fuscous along costa.

Underside forewing: smoky gray, whitish on costa and dotted with brown.

Two specimens: Scranton, Pa., April 21st and 22d, A. E. Lister.

This may be a variety of *P. spoliana* Clem.

Proteopteryx albicapitana sp. nov.

Expanse, California specimens, 20 mm.; Pennsylvania specimen, 17 mm.

Head: with scales long and forming a flattened crest on top and in front, concealing basal joints of antennæ; the scales in front, on the sides of the head, around the eyes, the patagia and a narrow edging on each side of thorax are blackish-brown; from top of head to posterior end of thorax the scales are pure white. Palpi scarcely twice length of head, slightly depressed, flattened, lower edge of tuft in nearly a straight line from base to tip of outer joint, which is not quite hidden, but is obscured above more than below; scales above in a well-rounded hump. Color: outwardly dark brown, flecked with dark cinereous; within and above at base white, brown extending over the outer half of upper and lower edges and slightly encroaching on the paler color. Male antennæ slightly dentate, finely ciliated beneath, female antennæ simple, purplish-brown. Abdomen very pale brown or faded straw color, with a band of whitish scales on each segment. Legs same, annulated with brown. Abdomen of eastern specimen much darker, yellowish-fuscous.

Forewing: blackish- or dark purple-brown, excepting a pure white dorsal band about one-third width of middle of wing. This white band sends up into the ground color three spurs: first, at its beginning close to but not touching base; second, at inner third; and third, at outer third before ocellic spot. The white

spurs are rather acutely pointed, while the brown depressions between them are rounded. The white band is continued at anal angle through lower half of ocellic space and into cilia, which is pure white to the apex, excepting a dot of brown just below apex and on outer shade of brown in middle of wing. On the third white spur, just before ocellic space, is a large dot of brown scales, connected by scattering brown scales, with a similar but less conspicuous dot on dorsum. In eastern specimens these dark scales form a rather large triangular spot resting on dorsum and entirely interrupting the white band, excepting at its extreme upper edge. On extreme dorsal edge between this spot and base are twelve or fourteen rather evenly-spaced brown scales; two or three of the same are scattered over the upper ends of the first and second spurs. On the costa, between fold and apex, five or six geminated short dashes, these are almost obsolete on the western specimens. Costal fold about one-third length of wing, closely compressed, narrow; concolorous with upper part of wing, and bearing several geminate pale dots, which in the western specimens are reduced to tiny specks on extreme costal edge.

The dark color of the wing is more of a blackish-purple than brown, it is strigulated with short, fine, irregular, black, transverse lines, more distinct along costal and outer margins. Before the cilia a narrow line of more or less connected dark dots form a continuation of the line of dots on dorsal margin, and before this dark line on outer margin a narrow shade of the white continues up, nearly to apex, from the dorsal band.

Hindwing: light purplish-fuscous, cilia paler, with a lighter and darker line at its base; same beneath.

Underside forewing: purplish-brown, rather shining, costal and ciliate white spots repeated

Eight specimens: Nevada Co., Cal., Sept.; Kern Co., Cal., Oct.; Placer Co., Cal., Sept.; New Brighton, Pa., March 22d (F. A. Merrick).

Cotype in U. S. Nat. Mus.

The outer margin is very oblique, at an angle of about forty-five degrees from the dorsal line. In the California specimens the depression at end of veins 4 and 5 is barely observable, the margin being almost straight. The depression is more pronounced in the Pennsylvania specimen; apex rounded; costa scarcely arched; forewing three times as long as wide.

It is not impossible that fuller knowledge of the life histories of the western and eastern forms may prove them to be separate and distinct, in which case I would propose the name *pennsylvaniana* for the latter.

Proteoteras arizonæ sp. nov.

Expanse 18–20 mm.

Head, palpi, antenna and thorax cinereous-white; outer surface of palpi speckled with black, thorax speckled with fuscous, and posteriorly edged with black; abdomen whitish, shaded with light fuscous above; legs whitish, banded and dusted with blackish-brown.

Forewing: yellowish-white or dirty white, more or less mottled with brownish-black. The dark color forms a fascia from middle of costa to anal angle, beginning at costa as an extra wide oblique costal line to upper third, below this it widens and is darker, and from its upper outer edge sends a spur into apex; the latter just before reaching apex sends a line down to below middle of termen. The oblique fascia is divided into three spots, as below the middle it is interrupted by a roundish spot of whitish scales. The basal area is not distinctly defined, but that part of the wing is more strigulated with black than the space between it and the fascia. The costa, before the fascia, is lightly marked with black, beyond the fascia with four brownish-black spots, the outer one close to the apex. The ocellic spot is large, of silvery-white scales on sides, with a spot of dull white scales, containing grayish and brown dots in the center, it occupies all of the the space between and below the fascia and streaks from same. Cilia white, preceded by a geminate submarginal line on lower half, shaded with fuscous at lower third and below apex, becoming blackish-brown at apex.

♂.—Hindwing: black, cilia white, silvery-white below costa and yellowish hair pencil.

Underside both wings: yellowish-white, the costa of forewing and the outer half of both wings, except at termen, entirely overlaid with black scales. The upper side of hindwing and lower side of both wings of the females are grayish-fuscous.

Five males and two females: Prescott, Ariz., July 5th and 18th, Dr. Kunze; Oak Creek Canon, Ariz., 6000 ft. elevation, Aug., Prof. F. H. Snow; Pueblo, Colo., July, F. H. Nash; Cold Spring, Colo., Dr. Dietz; Fort Collins, Colo., June 24th, Gillette; Denver, Colo., Dyar and Caudell, No. 16,736.

Cotypes in U. S. Nat. Mus. and University of Kansas.

Proteoteras crescentana sp. nov.

Expanse 16–18 mm.

Head, palpi, thorax and base of antenna very light brownish-white; outer side of palpi shaded with black and apical joint the same color, base of patagia shaded with brown; abdomen grayish-fuscous, lateral tuft white; legs whitish, dusted and banded with black.

Forewing: light gray, with a very strong, well defined black crescent from middle of costa to apex, it is broadest between costa and the lower side of the curve, which is below middle of wing, from there to apex it tapers gradually ending in apex as a narrow line. The black basal area is well defined above the middle of wing, its outer edge starting from inner fifth and running to inner third at middle; below this, it is indistinctly angled inward to dorsum. On the upper half of wing, between basal and crescent dark patches, is a fascia of whitish scales, which follows the underside of crescent above fold, nearly into ocellic spot; it is strigulated by a line of dark fuscous scales. Beneath fold from base to angle is a streak of brownish-ochreous, and the semi-circular patch of ground color on outer half of costa, enclosed by crescent, is of the same color. The ocellic spot is large, of gray and white scales, the inner and outer edges are leaden-metallic. Between the outer edge of ocellus and apex and before the inner side of

ocellus are small patches of brown, the latter being a continuation of the dorsal brown streak. Cilia gray, speckled with fuscous.

Hindwing: light brown, the hair pencil-fold edged with black; underside the same.

Underside forewing: grayish-fuscous, creamy-white below fold.

The hindwing and underside of both wings are the same in male and female specimens.

Seven specimens: Iowa, Gillette, Ac. Cat., Nos. 36 and 46; West Manitoba; Kansas; Cincinnati, Ohio, June 17th, Miss Braun; Plummer's Island, Md., June, A. Busck; Elk Grove, Ill., June 25th, K. L. McElhose.

Cotypes in U. S. Nat. Mus. and Miss Braun's collection.

Prateoteras torontana sp. nov.

Expanse 20 mm.

Head, palpi and thorax light brown; outer joint of palpi darker brown; antenna gray; legs whitish-cinereous, dusted with brown.

Forewing: yellowish-gray, dusted with brown. A brown crescent-shaped streak from middle of costa to apex, enclosing a costal patch of pure white, the costa in this patch dotted with three large and five small brown dots. The brown crescent streak is broadest on costa, narrower on lower curve, and at the apex it broadens, involving all the space above the indentation of termen. The inner half of costa, before the crescent, is bordered also with pure white, in which there are about six brown dots on extreme edge, and a line of three or four below on upper edges of cell. Cilia brown at apex, white below.

Hindwing: cinereous, speckled with brown, narrowly shaded with dark brown at outer edge and base of cilia, outer ends of cilia whitish, light whitish-brown, with a pure white spot in apex, cut by a narrow submarginal dark brown line.

Underside forewing: smoky brown, dark brown at apex and narrowly at termen, white costal patches and brown costal dots repeated.

One specimen: Toronto, Ont., June 5th; collected by Arthur Gibson; received from Dr. Fletcher.

Proteoteras naracana sp. nov.

Expanse 16–20 mm.

Head: brown, lighter in front; face white; palpi white, shaded with black on outside and upper edge; antenna light brown, basal joint brown, with a white spot on posterior side; thorax white, with a pair of joined olivaceous spots on front and a patch of same color on posterior end, patagia white, with yellow and brown scales at base and near outer end; abdomen fuscous, lateral tufts on anal segment white, anal tuft fuscous; legs yellowish-white, banded and dusted with blackish-brown.

Forewing: a white streak from base to outer fifth on upper part of wing; its lower edge runs from middle of base, slightly above fold and parallel to it, nearly to middle of wing, then goes obliquely upward to costa at outer fifth, it is indented by a semi-circular depression at the beginning of the upward angle beyond which its lower edge is overlaid with gray, and is bounded by a horizontal

elongated S-shaped black mark that lies between it and the ocellus. The extreme costa is olivaceous-green, with a large green spot at inner third and middle, with smaller ones before, between and beyond. The lower part of wing is mottled olivaceous-green and brown. There is a cluster of long whitish scales on dorsum at base, above which is a spot of whitish and fuscous-brown raised scales, before this tuft are three black dots in a triangle; before fold is another round button of raised scales and a third tuft above fold on outer fourth. The ocellic spot is grayish-white, with shining white side bars. From costa, beyond white patch, is a whitish spot, which sends a leaden-metallic streak under apex. Between this and apex is another white spot on costa on an ochreous-brown ground. Cilia speckled black and gray at base, fuscous outwardly.

Hindwing: smoky brown, male hair pencil black, cilia gray, with dark basal line, underside paler.

Underside forewing: same as upperside hindwing, with costal spots repeated.

Ten specimens: New Brighton, Pa., May 31st to June 19th, F. A. Merrick; Cincinnati, Ohio, May 26th to June 4th, Miss Braun; Wisconsin, Otto Buchholz.

Epinotis septemberana sp. nov.

Expanse 16–19 mm.

Head: ferruginous on sides and front, grayish on top; palpi ferruginous, dark gray within; thorax ferruginous, gray, base of patagia dark ferruginous; antenna grayish beneath, ferruginous above; abdomen and legs yellowish-gray, latter banded and dusted with dark brown.

Forewing: gray on dorsal third, above purple-lake, the latter color paler at base and along edge of costa. The gray shade is finely atomized with blackish-fuscous and extends from base to termen a quarter above anal angle; from base to inner fifth there are only scattered gray scales on dorsal margin, at inner fifth it swells to middle of wing, at inner third it narrows obliquely along line of fold to outer fourth where it swells again, but less than before and rounds off into termen. The purple-lake ground color, in the indentation between the two gray elevations, is darker than elsewhere. There are a few scattered scales of gray in ground color above the second elevation. A fine, diminishing line of gray at termen from the anal angle to apex. Cilia purple-lake above middle, fuscous below and whitish opposite the gray color at angle.

Hindwing: smoky gray, cilia paler, with a darker basal line; underside the same.

Underside forewing: smoky brown, marked with cream color on costa and a reflection of purple-lake below.

Twenty specimens: nineteen taken in Essex County Park, N. J., the last week of September for a number of years; one from Scranton, Pa., September, A. E. Lister.

Epinotia haimbachiana sp. nov.

Expanse 13–17 mm.

Head: brownish-gray, darker back of eyes; eyes purplish-brown; palpi gray, slightly darker outwardly, apical joint white; antenna gray; thorax gray, ante-

rior edge speckled with brown, and a double brown dot behind middle; abdomen, first three segments and tuft pale ochreous, other segments fuscous; legs whitish, banded with blackish-brown.

Forewing: ashy-gray, with lines, spots and shades of brown. The basal area extends to inner third at middle of wing and to inner fourth of costa and dorsum, outwardly it is blackish-brown, especially intense below middle and on dorsum for the outer half of the area; above and before the intense brown color the balance of the area is gray, strigulated with brown. Beyond is a broad grayish-white fascia, outwardly defined by a narrow, nearly obsolete brown shade from middle of costa to anal angle, outwardly oblique to upper third, then inwardly oblique to lower third, thence concave to dorsum, where its inner edge ends in a small brown dot. The whitish middle fascia is more or less dotted with brown, and a faint line of same color parallels its inner border. Beyond the narrow dark fascia a broader streak of shining gray scales starts below costa at outer fourth, goes to anal angle, circles the ocellus beneath to termen. The ocellus is in the middle of the wing of fine whitish lines on dark brown ground, with six or eight black dots and horizontal dashes; there are several fine short black lines in the shining gray streak below the ocellus and a third below costa. The costa is whitish-gray, finely and regularly marked with short brown lines, with four larger spots in outer half, the inner of which sends a brown streak obliquely to middle of wing, the next one sends a brown streak to termen beneath apex, with a spur between termen and ocellus. There is a brown-black semi-circle in apex, the outer half on the cilia, through the middle of it runs a dark brown terminal line, this line in the middle of wing is nearly obsolete, with a white line beyond it, it continues as a brown line around anal angle. Cilia fuscous, brown outwardly at apex, and white inwardly in middle.

Hindwing: light bronzy-brown, paler at base, underside gray.

Underside forewing: smoky brown, with geminated whitish costal spots. Some of the female specimens are dotted with light reddish ochreous, on upper part of middle light fascia, and the two lower ends of the costal streaks on outer half are the same color.

Twenty-five specimens: Philadelphia, June 3d to 23d, Frank Haimbach; Cincinnati, Ohio, Aug. 14th, Miss Braun; Wisconsin, Dr. Nason; Riverton, N. J., E. Daecke. One specimen from U. S. National Museum bearing labels "Steganoptycha near *Saliciana* Clem., and approximating *pauperana* (Europe) but apparently distinct from both C. V. R. 1886" (Wlsm.), and a smaller label referring to the slight cocoon and pupa case "found on ground Augt. 4 iss. Augt. 7, 1877."

Cotypes in U. S. Nat. Mus.

This species is close to my *E. ilicifoliana*, bred from ilex in New Jersey and North Carolina. It is a generally larger and lighter species, and can be separated by the absence of the oblique brown line from end of cell to apex, which is always present in *ilicifoliana*.

Mr. Haimbach, in whose honor the species is named, has collected scores of specimens in the daytime resting on the fence of a summer garden at the corner of Allegheny Avenue and Broad Street. The garden is filled with many varieties of shrubs and trees, and a careful examination early in May would certainly disclose the larvæ twisting the young leaves of a plant allied to ilex.

The generic notes regarding *ilicifoliana* will also apply to this species. They are both allied to Clemens *saliciana* and *salicicolana*.

Epinotia plumbolineana sp. nov.

Expanse 13.5–16 mm.

Head, antennæ and palpi dark cream or very pale brown. Scales on head erect above and between eyes, flattened on face. Palpi second joint with flattened truncated tuft, scales rather closely appressed, end of third joint not hidden. Palpi rather depressed and not quite the length of head beyond it. Scales forming collar, tipped with reddish wine color. Thorax same as head, smooth. Abdomen alternately banded with cinereous and fuscous, the lighter color, the tips of scales of each segment, anal tuft cinereous. Legs same as head, but in front and tarsi stained with wine color.

Forewing: grayish-white, tinged with cinereous ground color. A conspicuous wide-red fascia from middle of costa to anal angle, broadest on costa and as wide there as one-third to one-half of width of wing, gradually tapering to an obtuse point at anal angle. The inner edge of this fascia curves evenly and obliquely outward, the outer edge is sinuate, slightly concave above and convex below the middle, the outer edge is outlined by a slender line of white lustrous scales from costa nearly to anal angle, turning inward above and defining the obtuse lower point of this fascia. Beyond this fascia the entire outer margin is clouded with this same color, but a shade paler, roughly in the form of a triangle with the base resting against the cilia, the other two sides coming to a point just beyond end of cell. Above this triangle the costa from fascia to apex is ground color. On the extreme apex are a few blackish scales, and in some of the darker specimens a few of these scales are scattered over fascia and triangle. There are no distinctly defined subapical costal spots, but four or five short streaks of more lustrous white can be observed in some specimens. A basal area is only well defined in some of the darker specimens, in these it covers the inner third of wing, angulated on cell and of a light shade of brown. In the majority of specimens this light brown basal color shades into the ground color, without very distinct line of demarcation. A few dark dots mark this area in some specimens, usually paralleling the fascia. The central fascia is narrowly edged with a whiter shade than the ground color. The male costa is slightly curled up from base to outer edge of fascia, and in the hollow thus formed is a narrow line of dark leaden scales, doubtless a secondary sexual character, this line begins just beyond base and ends in middle of fascia. Cilia lustrous pink.

Hindwing: dark gray, cilia paler, preceded by a darker, then a paler line.

Underside forewing: dark smoky fuscous, with cinereous line along costa from outer three-fifths to just before apex. Cilia stained with dull pink, preceded by a darker then a paler line.

Underside hindwing: same as above.

Twenty five specimens: one, No. 33, Seattle, Wash., O. B. Johnson; two, Seattle, Wash., v 27, 1902, T. Kincaid, blue label 179, and white labels "willow," whether caught on willow or bred from larvæ on willow not stated; twenty-two, Wellington, Br. Col., June, Rev. Geo. W. Taylor, and Th. Bryant.

Cotypes in U. S. Nat. Mus.

Cydia cupressana sp. nov.

Expanse 14–16 mm.

Head: dark greenish-brown, scales tipped with cinereous on the face the latter predominates, making face lighter, scales of head form semi-circular tuft above eyes, meeting above as a slight crest. Palpi very short, tip of outer joint scarcely projected beyond face, scales of second joint rather closely compressed, tuft small, colored same as face, outer joint black, bare, short, blunt. Thorax smooth, shining fuscous, patagia same, but scales shading into whitish at outer ends, neither irrorated with lighter specks like head. Abdomen and legs above shining fuscons, paler below, anal tuft tinged with ochreous.

Forewing: dark chocolate-brown, very finely irrorated with transverse lines, pale yellowish-green scales beyond basal area and crossed by five rather broad metallic lines, of a silvery-salmon hue; only the first pair of lines in middle of wing are continuous from costa to dorsal margin, the third ends just before reaching dorsal margin, the fifth is but little more than a costal streak ending at vein 8, the outer line before the outer margin is divided in three parts by two evenly spaced interruptions. A small metallic dot below costa between fifth line and apex. On the extreme costa the metallic scales are replaced by yellowish-green. The metallic lines are partly bound by black, notably: before the first, beyond the upper third of the streak, which black streak follows along costa to third line and down its inner side to top of cell; the lower half of this third line is defined on its inner edge by black, the black line at its upper end turns outwards, at right angle, cutting through the metallic line, and continues to the inner edge of the fifth metallic line, which it defines for the length of its middle section; in some specimens the horizontal black line is not continuons, and the line before the fifth metallic is also broken into two to four short horizontal dashes. Black also outwardly defines the fourth short line. The basal area is ground color, slightly shining, lightly and sparsely dusted with yellow-green atoms, it occupies nearly a third of the wing on dorsal margin, a quarter on costa, its outer margin oblique for two-thirds of its length, then vertical to dorsum. The metallic lines are nearly parallel to each other, the space between first and second is widest, the ground color between these two lines is also more heavily overlaid, with the pale atoms, the same is the case between third and fourth, and between fifth and apex; making an effect of three paler fasciæ, separated by two narrower darker fasciæ. Cilia luteous-metallic, preceded by a narrow brown-black line, the latter interrupted a third below apex by a small square yellowish-green spot.

Hindwing: deep smoky brown, cilia white, preceded by a brown line, and this by a faint narrow pale line; long hairs near base on veins 1 and lower median vein white.

Underside both wings: dull brown; underside forewing: costa marked with

pale yellow beneath the metallic lines above, the small pale spot on outer margin is also repeated, cilia shining brown. The cilia of hindwing is same as above, the tips of scales below outer half of costa and in apex are pale yellowish-green, giving the outer half of wing an irrorated appearance.

Described from ten specimens in the U. S. National Museum, bred from seed-pods of *Cupressus macrocarpa*, Alameda Co., Cal., issued Jan. 1 to 24, 1886, breeding number 68.

Cotypes in U. S. Nat. Mus.

Cydia piperana sp. nov.

Expanse, ♂ and ♀, 18.5 mm.

Head, palpi and thorax cinereous-gray, with atoms of paler gray. Abdomen and legs shining fuscous. Palpi porrect, ascending, second joint long, loosely clothed, third joint bare, extends beyond face.

Forewing: dull brown; closely, evenly and heavily overlaid with pale yellow atoms, these atoms not arranged in parallel transverse lines as in *cupressana*. Several metallic, silvery lines, with bluish reflections, cross the wing. One, just before the middle from costa to dorsum, nearly vertical, but slightly bulging outward about middle; the second, beyond middle, runs obliquely to dorsum before anal angle, and there joins a preciliate metallic line, the latter arising on costa at apex. Between second and outer lines are two short ones on costa, the outer is double the length of the inner, and is oblique. The metallic lines are narrowly edged with black. Cilia shining luteous, preceded by a narrow black line.

Hindwing: smoky fuscous, darker towards apex, cilia white, preceded by dark fuscous line, and it preceded by a very narrow whitish line.

Undersides both wings: shining fuscous, with a coppery reflection. Cilia same as above.

Two specimens: Pullman, Wash., April 11, 1898; collected by Mr. C. V. Piper, in whose honor the species is named.

Cotype in U. S. Nat. Mus.

Cydia inquilina sp. nov.

Expanse, ♀, 14–15 mm.

Head: shortly and loosely scaled in front and above, face small, cinereous, thickly dotted with fuscous or smoky brown. Palpi short, scarcely extend beyond head, second joint above with compressed scales, below loosely clothed with short scales hanging vertically downward, from end of second joint to base; outer joint as long as second, depressed, not hidden by tufts of second, closely clothed with short, compressed scales; pale cinereous, excepting all of third joint and a patch on outer sides of outer half of second, which are smoky black. Antennæ (female) simple, cinereous, lightly annulated with dashes between segments. Thorax smooth, it and patagia cinereous, thickly dotted with smoky brown. Abdomen dark fuscous, posterior edges each segment cinereous. Legs cinereous, annulated with smoky brown.

Forewing: smoky brown, tinged with ferruginous, minutely and thickly dotted with cinereous. A large patch of coppery-metallic scales in middle of wing below

costa, and a smaller vertical patch of same color before ocellic spot. A sinuate line of same color scales outlines outer side of ocellic spot, this line is interrupted in middle, and beyond the break on outer margin is a dot of same color. Several horizontal black streaks in ocellic spot. Costa from inner third to apex black, which is broken by six geminated cinereous dashes, about evenly spaced. Excepting the two apical pairs, these geminate dashes are heavily overlaid with bluish-metallic scales, most conspicuous in four short oblique lines at and beyond middle of wing, and an extended line from third spot before apex, which continues below the outer spots to outer margin about a quarter below apex. A narrow shade of ochreous-red or wine color from before middle covers upper part of wing below costa, turning downward at apex and ending on outer margin at anal angle. This reddish shade sharply contrasts with a black preciliate line on outer margin, and with the black and metallic streaks along the costa. In the apical third are a few short horizontal streaks of black. Cilia fuscous, with a shining purplish reflection.

Hindwing: smoky fuscous, paler basally, cilia pale fuscous, preceded by a broader, darker and a narrower paler line. Underside same.

Underside forewing: very dark, smoky, black; cilia same, preceded by slightly paler line; costal cinereous dashes faintly separated.

Three female specimens: two labelled "San Francisco, California, Mrs. Knickerbocker," and one red ink number 69, Seattle, Washington, O. B. Johnson.

Cotypes in U. S. Nat. Mus. and in my collection.

Ancylis intermediana sp. nov.

Expanse 12.5–14 mm.

Head, palpi, thorax and antennæ pale cinereous; palpi projecting two-thirds length of head before it, usually depressed, second joint heavily scaled, not compressed, entirely concealing third joint, sharply truncated at outer end. Scales of head long, forming small brush in front and ridge between eyes. Abdomen shining gray, anal tuft cinerous; legs cinereous, a shade paler between joints.

Forewing: pale gray, overlaid with shining whitish scales = ground color. Large dorsal and other prominent spots olivaceous-brown = dark color. Large dorsal spots from base to anal angle on dorsum, upper edge from middle of base, swelling gently upward, reaching highest elevation at about inner third, where it is as wide as three-fifths the width of the wing, evenly rounded on top, thence descending, evenly without prominences towards anal angle, slightly sub-sinuate before angle; a continuous line of dark color is continued from anal angle as a preciliate line and merges into the dark color at apex. At the middle of costa an oblique fascia begins, but extends only two-thirds towards anal angle, and widens out into a well-defined lunate spot, the inner, lower and outer margins forming the curved portion; a falcate dark color spot in apex, preceded by eight short oblique dashes of same color on costa between apex and central fascia. These dark costal spots are separated by oblique lines of white lustrous scales, the lower points of each of the outer four are overlaid with lustrous blue, a few scales of same color beneath apex; the inner bounds the upper edges of lunate spot and runs into a line of bluish lustrous scales dividing this spot from the ocellic space; the next outer white line merges with the inner, the third and fifth are very

short and less than half the length of the fourth, sixth, seventh and eighth white lines. The first to sixth are outwardly oblique, the seventh vertical and eighth inwardly oblique. The dark costal dashes on each side of the sixth white line join together below and form a distinctly defined sinuate line, the outer edge of which rests on middle of outer margin. The inner boundary of this line is defined by a line of bluish lustrous scales, which also separates it from outer edge of ocellic patch. The pale ground color covers upper two-fifths of wing on costa before central fascia, thence descends in an easy sweep, with almost parallel edges between dorsal and lunate spots to the dorsum, then into and forming the ocellic space; a faint shade of darker scales crosses it on upper edge of cell, and in the ocellic space it is slightly overlaid with darker scales. The lunate spot at its outer end is cut by a short horizontal line of black scales, with a dot of same above the line. Cilia shining white, cut by a long black dash beneath apex and a shorter one below this, and margined inwardly by a row of black dots between apex and middle; below apex outer ends of cilia shaded with olivaceous-cinereous.

Hindwing: olivaceous-gray, cilia paler, preceded by a darker and a lighter line, the laiter the narrowest.

Underside both wings: shining fuscous, hind wing paler than forewing; cinereous along costa of fordwing, with darker spots repeated. Several dark dots on outer half of costa of hind wing. Cilia cinereous.

Nineteen specimens; male and female, one Seattle, Wash., O. B. Johnson, No. 51; eighteen, Wellington, Br., Col., Rev. Geo. W. Taylor and Th. Bryant, May and June.

Cotypes in U. S. Nat. Mus.

Enarmonia walsinghami sp. nov.

Expanse 15–20 mm.

Head: smoky brown; palpi light brown, darker on ends of scales and apical joint; antennæ fuscous; thorax bronzy-black; abdomen dark fuscous, anal tuft brownish-ochreous; legs light brownish-ochreous, annulated and dusted with blackish-brown.

Forewing: brownish-black, on the inner half of costa are seven or eight ochreous dots on the extreme edge, four larger and more prominent dots are on the outer half, but do not extend below the edge. The white dorsal patch is large and roughly triangular in shape, it extends to middle of wing on the dorsum, within the spot are two small black dots; there is a gray shade extending from upper end of the white patch to the costa before middle; a similar gray shade extends from the three inner costal marks; beyond the middle, to middle of cell and from the fourth, a pair of lines of the same color to the middle of the termen; between these gray shades and between the outer one and termen the ground color is overlaid with scattered black and ochreous-brown scales. The ocellus consists of a large U-shaped mark of gray-metallic scales, the lower rounded part resting on the termen above the angle, and the upper open and extending to beyond middle of wing. Cilia smoky brown, preceded by irregular darker line.

Hindwing: dark smoky brown; underside the same, but less dark cilia shining fuscous.

Underside forewing: same as hindwing, with ochreous costal marks and the white dorsal patch repeated.

Seven specimens: Hemlock Falls, N. J., April 29th; Essex Co., N. J., April 30th and May 4th; Great Notch, N. J., May 4th; Tryon, N. C., W. F. Fiske.

Cotype in U. S. Nat. Mus.

This is the eastern representative of the Californian *americana* Wlsm. Since the note published in Proc. U. S. Nat. Mus., xxviii, 362, 1905, I have received additional material which makes it very evident that the species are distinct. I take pleasure in dedicating the new form to Lord Walsingham, whose careful work on North American Tortricids is so well known and appreciated.

Enarmonia dyarana sp. nov.

Expanse, ♀, 16–17 mm.

Head: dark gray-brown, lighter in front; palpi light clay color, the long hair on the outer side of tufts fuscous; apical joint fuscous; antennæ blackish-fuscous; thorax blackish-fuscous, patagia of an olivaceous-fuscous shade; abdomen blackish-fuscous, anal tuft and underside anal segments whitish.

Forewing: blackish-brown, the outer fourth faintly irrorated with yellowish scales. On the costa before the middle is a pair of white dashes joining at top of cell and continuing to middle of cell as a dull leaden metallic line. Beyond the middle are four pairs of similar dashes, from all descend lines of metallic scales, that from the inner pair nearly joining the upper end of the dorsal mark. There is a small metallic spot on termen below apex; and beyond it, interrupting the black terminal line, is a patch of cream-colored scales. The ocellic spot is absent, but represented by a vertical bar of metallic scales starting from dorsum at anal angle and slightly curving inward to above middle of wing. The white dorsal mark arises from beyond middle of wing and inclines outward, it is composed of two white lines which come close together at middle of their length, and are separated at each end, they extend to above middle of wing, the scales at upper end metallic. Cilia shining fuscous.

Hindwing: smoky fuscous, cilia paler; underside the same.

Underside forewing: shining grayish-fuscous, with costal dashes as well as ocellic bar strongly reproduced in cream color, a dash of same through middle of cell.

Three ♀ specimens: Colorado, collected by Dyar and Caudell.

Cotypes in U. S. Nat. Mus. and my collection.

This species is roughly scaled and will go in the same class as *E. americana*.

Enarmonia edwardsiana sp. nov.

Expanse 12–14 mm.

Head and thorax blackish-brown; palpi pale clay-brown; antenna black; abdomen blackish-fuscous, external tips of scales on underside paler, anal tuft ochreous; legs whitish-gray, powdered with blackish-brown.

Forewing: brown, with a slight bronzy tinge; in the fresh specimen rather heavily streaked with gray from base to termen. On the costa below middle are two oblique white streaks, between them and base another white shade that does not extend below costa; beyond the middle are four pairs of white costal dashes, the inner one of the first pair giving off a short line of lilaceous metallic scales; the outer one of the second pair gives off a similar line, which runs beneath the third pair; the outer dash of the fourth pair continues as a broken line of metallic to termen beneath apex; these white dashes are separated by black interspaces. The ocellic spot is absent, being represented by a vertical bar of yellowish-gray metallic scales. The white dorsal streak is slightly beyond middle of wing and consists of two narrow oblique lines joined together at the top by metallic scales, and this extension reaching above middle of wing. Between the two lines on dorsum is a tiny white dot, a similar dot on dorsum before the first line; one or both of these dots are absent in some specimens. Cilia shining leaden, preceded by a black terminal line.

Hindwings: dark bronzy-brown, tuft of hair scales at base of median vein and cilia white. Underside whitish-bronze, mottled along costa with darker brown.

Underside forewing: same as hindwing, but outer half shinish reddish-bronze; costal spots strong, repeated.

Four specimens: three Henry Edwards' collection, Am. Mus. Nat. Hist., Reg. Nos. 14,564, 14,568, and 14,569, Coll. Nos. 236 and 235, California; one specimen, San Francisco, Cal.

Cotypes in U. S. Nat. Mus. and in my collection.

This species is similar to our eastern *E. tristrigana* Clem., but can be distinguished by the different dorsal marks. The three specimens from the Edwards' collection are somewhat faded, and are of a light cinnamon brown, the gray streaks absent, but the costal, ocellic, and dorsal marks agree with the fresher specimen.

Enarmonia lana sp. nov.

Expanse 13 5–15 mm.

Head: fuscous, dark cream in front; palpi whitish, with a few dots on brown on outside of tufts; antennæ fuscous; thorax olivaceous-brown; abdomen purplish-fuscous, shining, outer ends of scales on underside whitish-fuscous; legs bronzy-brown.

Forewing: brownish-bronze, shining all over. There are two short oblique white dashes on costa before middle; beyond middle are eight white dashes, the inner pair geminate, and the six outer ones arranged in three pair, interspaces dark brown; from the inner dash and from the first pair, short lines of bluish-metallic scales parallel the costa; a short line of the same is below the eighth. There is a dot of the same in termen beneath apex. The ocellic spot is absent, but represented by a vertical bar of golden metallic scales reaching to middle of wing, between it and termen the ground color is overlaid with yellowish scales. The dorsal mark is broad and divided into four lines, they are somewhat contracted at the top, where they reach to the middle of the wing. Terminal line dark brown, cut below apex by a black streak, bordering which below is a white scale.

Hindwing: dark bronzy-brown, with a dash of whitish at base, cilia pale fuscous. Underside of both wings dark bronzy-brown, with costal dashes faintly repeated.

Two specimens: one ♂ and one ♀, Colfax, Placer Co., Cal, July, Collected by A. H. Vachell.

This species is also similar to the eastern *tristrigana*, but can be separated by the difference in costal and dorsal marks.

Enarmonia placerana sp. nov.

Expanse, ♂, 12–14 mm.; ♀, 14–16 mm.

Head: fuscous-brown, paler in front; palpi pale clay-brown, tips of brush and apical joint blackish-brown; antennæ black, with a bronzy tinge; thorax olivaceous-brown, patagia tipped with white; abdomen fuscous-brown, external scales, underside, white; thorax whitish-ochreous; legs cinereous-gray, powdered with fuscous.

Forewing: bronzy-brown, shaded with leaden gray on inner third on dorsal and costal margins of male. Before the middle of costa there are two white marks on extreme edge next to base, between these and middle are two white oblique dashes, the lower ends continuing as pale blue-metallic, and almost running into top of dorsal mark. Beyond middle are eight narrow oblique white dashes, the first sends a metallic-blue line obliquely across wing and joins the upper end of the vertical ocellic bar; from the fourth a metallic blue line runs parallel to costa and combines with a similar extension from the eight. The ocellus is represented by a vertical bar of silvery-gray metallic scales, the lower end resting on termen above anal angle, it curves slightly inward. The white dorsal patch is broad and divided into two lines by a line of brown, in some specimens each side line is subdivided by a central dotting of brown scales; it curves slightly outward, and in the ♀ specimens there is a tendency to broaden out at upper end, which reaches to middle of wing and terminates in a few metallic blue scales. Terminal line black, cut below apex by a dash of whitish-fuscous. Cilia leaden-fuscous.

Hindwing: dark bronzy-brown, cilia fuscous, underside both wings the same, with costal dashes repeated.

Three ♂ and four ♀ specimens: Placer Co., Cal., May to June; six collected by A. H. Vachell; one, collection of U. S. Nat. Mus.

This species is marked like *tristrigana*, but the shape of the wings and rather rough scales place it in the same class as *americana* Wlsm.

Enarmonia wana sp. nov.

Expanse 10–12 mm.

Head: gray, speckled with darker gray; palpi pale cinereous, upper end of tuft a shade darker, outer joint blackish; antenna gray, with darker annulations at joints, thorax bronzy-brown, with a reddish-green tinge; abdomen shining blackish-fuscous above, paler beneath, anal tuft whitish; legs whitish-gray, shining iridescent scales.

Forewing: shining bronzy-brown. Before the middle are three white costal dashes, the inner one nearly obsolete, each continuing to top of cell in lines of leaden-metallic. Beyond the middle are three pairs of white costal dashes, the two inner pairs close together, the outer close to the apex, all are continuous as

golden-metallic lines to a third below costa. The ocellic spot is olivaceous-yellow, crossed by four horizontal black lines; the vertical side-bars are golden-metallic, the inner one connecting with first costal line beyond middle. The dorsal white patch, which is divided by a brown dot on dorsum, about three times as long as wide, curving outward slightly and reaching but a trifle above fold; from the outer upper edge it is continued as a metallic line to above middle of wing approaching but not joining the metallic line from costal spot before middle. The tips of the scales on upper half to middle, in apex and before termen are tipped with yellow. There is a dark brown terminal line cut by a white dash below apex. Cilia shining fuscous.

Hindwing: bronzy-brown, paler towards base, cilia same inwardly, white outwardly; underside shining gray-white.

Underside forewing: shining bronzy-brown, with costal spots repeated. In certain lights there is a greenish bloom over both surfaces of both wings.

About fifty specimens: Carmel-by-the-Sea, Monterey Co., Cal., April; San Luis Obispo, Cal., March; all collected by A. H. Vachell.

Euarmonia zana sp. nov.

Expanse 10–15 mm.

Head and thorax grayish-brown; palpi pale clay color, ends of tuft and third joint blackish; antennæ fuscous-brown; abdomen blackish-fuscous, paler between joints, anal tuft ochreous; legs pale brown, heavily overlaid with black.

Forewing: bronzy-brown, with a metallic bloom in certain lights; the costa is marked with three obscure whitish spots before middle, from the outer two of which an obscure milky white shining fascia follows to middle then angles inward to dorsal margin. Beyond middle is a group of four white costal dots, obscurely geminate, the inner sends a line of shining silvery scales obliquely to middle thence down to dorsum, where it forms the inner bar of the ocellic spot; a short shining line from fourth spot joins the preceding at middle of wing. Before the apex are two hook-shaped white dashes, the outer one sending a broken line of shining scales to middle of termen; before these two dashes is an obscure white spot on costa, which sends a broken line of metallic scales to anal angle, the lower part forming the outer vertical bar of ocellus. The ocellus consists of a shining yellowish patch, divided by four short horizontal lines, these lines do not reach the side-bars, the outer bar is defined on its inner side by a broken row of black dots, with a few black dots on its outer side. The ground color of the outer half of the wing is heavily overlaid with golden-yellow scales. Cilia shining fuscous, preceded by a dark fuscous line.

Hindwing: rather light bronze, cilia pale gray, shining; underside brownish-gray, rather heavily reticulated with pale gray scales, especially at outer end of wing.

Underside forewing: upper half bronzy-brown, shading into a brownish gray below; costal spots repeated.

Twenty-four specimens: Wellington, Br. Col., May and June, Geo. W. Taylor and T. Bryant.

This species is similar to *E. vana*, but can be separated by the arrangement of costal-spots and the ocellic spots.

Enarmonia vana sp. nov.

Expanse 13–15 mm.

Head and thorax dark gray, with a bronzy tinge, face pale yellowish gray; palpi yellowish-gray, with tips of scales and apical joint blackish; antennæ fuscous, finely annulated with yellowish-gray; abdomen blackish-fuscous above, cinereous beneath; legs whitish-cinereous, thickly powdered with dark brown.

Forewing: shining bronzy-brown; the strongest marked character is the ocellic spot, consisting of a patch of cream-colored scales, with a pinkish tinge and divided by four horizontal black lines; before and beyond this patch is a vertical bar of golden-metallic scales, also with a pinkish hue. The costa is marked by about six geminate cream-colored dashes; from the two pairs before the middle descend obliquely to top of cell obscure pinkish-metallic lines, which merge there, and an irregular and more or less obscure fascia of the same color reaches the dorsum at middle of wing. Beyond the middle the first and third pair of spots give off lines of pink-metallic, which approach each other about the middle of wing and nearly merge into the inner bar of the ocellic spot. A similar line curves outward from the second spot before apex, but ends before the termen; the dot before the apex gives forth a similar line, which runs into termen under the apex and causes a break in the black terminal line. The scales of the ground color of the outer half of wing are very faintly tipped with yellowish, giving a strigulated appearance. Cilia shining leaden.

Hindwing: light bronzy-brown, cilia same, with a leaden hue; underside same.

Underside forewing: darker than hindwing, costal spots strong, repeated.

Eight specimens: Colfax, Placer Co., Cal., July; collected by A. H. Vachell.

Enarmonia tana sp. nov.

Expanse, ♂, 12–13 mm.; ♀, 15–16 mm.

Head: olivaceous-gray, collar and face cinereous-gray; palpi cinereous, third joint blackish; antennæ fuscous; thorax olivaceous-gray, patagia streaked with whitish-gray; abdomen blackish-fuscous, with a few long white hairs from posterior segments; legs cinereous, dotted and annulated with dark brown.

Forewing: basal area dark leaden-gray, outwardly irrorated with yellow, followed by a broad cream-yellow central fascia, beyond which the leaden-gray ground color is heavily irrorated with vertical lines of creamy-yellow scales, except in the ocellic area, where the yellow lines are horizontal and separate the four horizontal black lines. From the outer third of costa is a wedge-shaped, cream-colored patch extending to middle of cell, and between its lower end and the central fascia is a smaller rectangular spot of the same color. This costal patch is marked on either side by a more intense yellow spot on costa, and is interrupted by one strong and one weak black costal dot; there is a similar black costal dot in central fascia. There are three transverse lines of shining leaden-metallic scales in the middle of the wing, two in the central fascia, the inner a little beyond the inner edge and extending only to middle of wing, the outer outlining this fascia, the third an equal distance beyond the second, its lower half forms the vertical inner bar of the ocellic space. There is a fourth line of the same scales from a broad white costal patch before apex to anal angle, interrupted twice, its lower half forms the outer vertical bar of the ocellic spot. There is a fine black terminal line, and the cilia is shining cinereous.

Hindwing: bronzy-brown, cilia white; underside brownish-fuscous, cilia gray.

Underside forewing: steely-brown, costal spot repeated, cilia shining leaden, preceded by a darker and lighter line.

Twenty specimens: Verdi, Nev., June 20th to 30th; Cisco and Colfax, Placer Co., Cal., June and July; all collected by A. H. Vachell.

Enarmonia vancouverana sp. nov.

Expanse 11–13 mm.

Head and thorax dark brown, nearly black; palpi cinereous; antennæ black; abdomen dark purplish-fuscous, tuft ochreous; legs dark gray, tarsi annulated with cinereous.

Forewing: bronzy-black, a grayish shade at base and less black and more reddish-brown at outer end. The costa is marked with four pairs of white, oblique dashes, from each pair a line of metallic-blue scales, none of them go below one-third the width of wing; opposite the end of the apical line is a tiny blue dot on termen below apex. The ocellic spot is absent, being represented only by the inner vertical bar of lilaceous scales. The white basal dash is narrow, slightly curved outwardly, does not reach to middle of wing. In some specimens it is divided by a line of ground color; in one, the two halves are joined together in the middle, leaving forked ends below and above. Terminal line black. Cilia shining fuscous.

Hindwing: bronzy-brown, underside grayish-brown, cilia fuscous.

Underside forewing: bronzy-brown, with costal spots repeated.

Ten specimens: Wellington, Br. Col., June, T. Bryant.

This very black species can hardly be mistaken for any other. I notice a small amount of variety in the costal marks of several of the specimens, there being an extra white dash between the third and fourth pairs.

Enarmonia saundersana sp. nov.

Expanse 10–12.5 mm.

Head and palpi: cinereous-gray; thorax and abdomen fuscous, latter cinereous beneath; legs cinereous, dusted with brown.

Forewing: bronzy-brown, shading to gray basally. Costa with ten rather long, oblique, wedge-shaped, whitish dashes, with blue continuations from first, second, fourth, seventh and tenth. The ocellic spot is nearly obsolete, being represented only by the vertical inner bar of lilaceous-metallic scales, narrowed, edged with black on the inner side and a few irregularly placed black dots between outer edge and termen. The dorsal mark is nearly obsolete, it consists of four faint whitish lines, with their upper ends converging and ending a little above middle of wing, the upper ends are overlaid with bluish-metallic scales. Termen line black, and a black dot in apex. Cilia shining fuscous.

Hindwing: bronzy-brown, cilia same as forewing.

Underside both wings: bronzy-gray, with costal spots repeated.

Four specimens: Toronto, Can., May 24th to June 11th; "On Lupin," H. S. Saunders.

Enarmonia fana sp. nov.

Expanse 7.5–10 mm.

Head and thorax in some lights like the grayish-blue bloom of a ripe plum, in other lights with a purplish-metallic reflection; palpi yellowish-white, outer joint darker; abdomen above same as thorax, beneath cinereous; legs cinereous, dusted with brown.

Forewing: bronzy-brown, but shaded with the plum-bloom in the inner fourth. On the costa are eight broad, oblique white lines divided by dark brown and extending to top of cell; from the first, third, sixth and eighth the lines are continued as pale metallic-blue. That from the third spot runs obliquely to and joins the inner metallic bar of the ocellic spot; that from the sixth spot goes towards but does not join the outer bar; the blue beneath the eighth is but a few scales. The ocellic area is large, filling the outer fourth of wing from anal angle to above middle; it consists of six black lines (the upper line is a row of dots, and the lower is short, with a spur angling downward), the vertical side-bars are shining lilaceous-metallic, the inner is double the width of the outer. In the middle of dorsal margin is a large white spot, in some specimens not divided, but in others divided by a line of brown, it is slightly inclined outward and reaches but a trifle above the fold, on its upper end the white is replaced by lilac-metallic scales which obscurely extend to middle of wing. The extreme edge of termen is brown, cilia shining leaden, with a white cut just below apex.

Hindwings and underside of both: bronzy-brown, shading to grayish-brown at base.

Ten specimens: Anglesea, N. J., May 15th to 30th; Essex County Park, N. J., May 15; Cincinnati, Ohio, Aug. 3d, Miss Braun.

Close to *interstinctana* Clem., *bracteatana* Fern. and *maculana* Fern.

Enarmonia angleseana sp. nov.

Expanse 10–11 mm.

Head above and thorax bronzy-gray, with a blnish reflection, face whitish-gray; palpi cream color, apical joint a shade darker; abdomen blackish-fuscous, with a purplish reflection above, a band of cream color on each segment below; legs whitish-cinereous, shaded with light brown.

Forewing: bronzy-brown, with a leaden shade at base. The outer three-fourths of costa is marked with nine rather broader lines; all, excepting the third, which is yellow, pure white; these white lines are unusually long, reaching to top of cell; from the first and second, which join together and separately from the fourth, seventh and ninth, are short lines of pale metallic-blue scales. The ninth outlines a large blackish-brown apical spot. In the ocellic space are five horizontal black lines, separated by four yellow lines, the latter are joined together inwardly, forming a vertical yellow bar; on either side the ocellus is enclosed by a bar of lilaceous-metallic scales, the inner bar being the broader and longer. Between this inner bar and middle of wing is a large shining yellow dorsal spot, composed of five or six vertical lines, reaching almost to middle of wing, the two outside lines are somewhat inclined towards each other at the top. Cilia shining, leaden-brown.

Hindwing: dark bronzy-brown, cilia grayish-brown; underside bronzy-brown, costal spots strongly repeated; over both wings is an irridescent sheen or bloom, when held at certain angles.

Forty-five specimens: Anglesea, N. J., from middle of May to end of June; one specimen, labelled "Mass.," from C. V. Riley collection, National Museum.

Cotypes in U. S. Nat. Mus.

Nearest to *interstinctana* Clem., but readily separated by the white dorsal mark of the latter. This species occurs in countless numbers in the shrubbery along Five-Mile Beach. At every step dozens rise and settle on the leaves of any convenient plant, where, for a moment or two, they strut around, very similar to the habits of the Choreutis.

Enarmonia dana sp. nov.

Expanse 12–13 mm.

Head: hoary-brown; palpi same, but cinereous at base; antenna gray, finely annulated with black; thorax hoary-brown, with an olivaceous tinge; abdomen fuscous, tuft cinereous; legs whitish-gray, dusted with brown.

Forewing: olivaceous-brown, eight or nine obscure whitish dots on costa, those beyond middle geminate; from each costal spot descends a line of pale blue, before the middle these are short, the two in the middle join a quarter below costa and send an oblique line to dorsum before the obsolete ocellic spot. The two spots beyond this blend and send a single line to termen below apex The apical part of wing is minutely dotted with yellow scales. There are four black dots on termen below middle, and the lines of blue scales are bordered inwardly with black dots. Cilia shining, leaden-brown.

Hindwing: smoky brown, cilia shining, leaden-brown.

Underside forewing and hindwing: shiny smoky brown, with costal spots faintly repeated.

Eight specimens: Montclair, N. J., May 24; Caldwell, N. J., May 17th and 22d; Wyoming Co., Pa., 2300 ft., June 17th.

Enarmonia dandana sp. nov.

Expanse 12 mm.

Head and palpi cinereous; antenna shining fuscous; thorax brownish-fuscous; abdomen dark fuscous, with a purplish reflection, anal tuft gray; legs whitish-gray, dusted with fuscous.

Forewing: smoky brown, in certain lights with a metallic sheen over the whole surface. Before the middle the costa is marked with closely set dots of obscure white, each terminating below in a few pale blue scales. Beyond the middle are five conspicuous geminate white spots. The inner one sends a line of blue obliquely to upper angle of cell; from the middle one a similar blue line goes to termen below apex. Above the anal angle and well before the termen are four horizontal black lines, enclosed before and behind by vertical bars of shining lilaceous scales. This ocellic spot is higher up and farther in than its usual position. A line of black scales lie between the two blue lines from costa. The

brown ground color is sparsely dotted with yellow scales on the inner two-thirds of wing and closely on the outer third. Cilia shining, leaden.

Hindwing: smoky brown, a shade paler at base, cilia gray, but tinged with brown at apex; underside smoky brown.

Hindwing: slightly lighter than forewing. the costal dots of the latter are faintly repeated.

Four specimens: Essex County Park, N. J., on hills back of Montclair, in light trap, Aug. 28th.

This species is much like *E. dana*, but can be readily separated by the strongly developed ocellic spot, which is entirely wanting in *dana*. I have male and female of both species.

Enarmonia garacana sp. nov.

Expanse 14–16 mm.

Head and palpi olivaceous-gray, outside of palpi blackish; antenna dark fuscous; thorax speckled fuscous-gray, posterior end fuscous, preceded by a whitish streak; abdomen fuscous; legs whitish, dusted and banded with brown.

Forewing: olivaceous-fuscous, with three broad geminate whitish fasciæ from costa to middle of wing. On costa beyond middle are four shorter whitish geminate spots and a white dash before apex. Between dorsum and fold are two whitish patches, each divided by a darker line, one at inner fourth and one in middle. From the outer third of costa a bluish-metallic line crosses wing to anal angle, where it ends in a white dash in cilia, a similar metallic line from costal spot before apex ends as a white dash in cilia at middle of dorsum. Ocellic spot obsolete, consisting of a few scattered metallic scales. Termen edged with a fine black line. Cilia leaden-gray.

Hindwing: bronzy-brown, cilia whitish, with a darker basal line; underside grayish.

Underside forewing: smoky brown.

Four specimens: Chicago, Ill., July, J. H. Reading; Trenton, Ontario, J. D. Evans.

Sparganothis taracana sp. nov.

Expanse 13.5–20 mm.

Head and palpi reddish-ochreous, latter paler within; thorax dark ochreous, patagia purplish-ochreous; antenna pale ochreous, shaded with purplish towards base; abdomen ochreous; legs whitish, with an ochreous reflection, dusted with pink and purplish-ochreous.

Forewing: pale ochreous, or light canary-yellow, under a lens the extreme tips of each scale has a bluish-irridescent reflection. The extreme base is pinkish-purple, this dark shade extends along costal and dorsal margins to inner sixth. There is a narrow fascia of the same color across middle of wing, interrupted in the middle of the cell, it is slightly farther away from base at dorsal than at costal margin. There is a narrow subterminal fascia of the same color between veins 2 and 7, broadest in the middle. At outer fourth of costa there is a faint shade of the same color. There are four specimens with the middle fascia. I have thirteen which I consider the same species, in which the middle fascia is

obsolete, being indicated on extreme costal edge by a faint shade. Cilia opposite the yellow are concolorous, opposite the purplish the dark color overruns the cilia at base, but extreme edge is yellow.

Hindwings: very light pinkish straw color; underside pale ochreous, streaked with darker ochreous below costa and in middle of wing.

Underside forewing: ochreous, shaded with pinkish, the central and terminal fasciæ are lightly repeated.

Seventeen specimens: Hastings, Fla., March, April, Sept., Oct., and Nov., A. J. Brown; Burnet Co., Texas, F. G. Schaupp.

The varieties with and without the central fascia occur in both the spring and fall and in both Florida and Texas.

Sparganothis yumana sp. nov.

Expanse, ♂, 14 mm.; ♀, 16 mm.

Head, palpi, thorax, abdomen and forewing light ochreous in the male, and dark ochreous in the female. In the latter there are a few dark scales between lower vein of cell near its outer end and fold, and an almost invisible narrow darker shade from outer third of dorsum to middle of costa. Cilia concolorous.

Hindwing of male same color as forewing; of female, light ochreous, darker around the edges; underside both wings light ochreous in male, darker in female.

One ♂ and one ♀: Yuma Co., Ariz., desert; received through J. B. Smith.

Sparganothis bistriata sp. nov.

Expanse 22–24 mm.

Head and palpi yellow, darker outwardly; thorax yellow, patagia dark ochreous at base and apex; antenna pale yellow; abdomen and legs dirty yellow, latter banded and dusted with purplish-red.

Forewing: bright canary-yellow, strigulated with vertical lines of shining opalescent scales, in a general way following the curve of the termen; these bright lines cross wing from base to termen, and each forms a shining spot on costa. There is a costal line of bright red from base to outer sixth, a similar band through middle of cell from base to end of cell, a slight shade of the same color on dorsum at outer end of fold. Cilia yellow.

Hindwing: above and below pink or dark flesh color, cilia whitish.

Underside forewing: ochreous, shaded with pink through middle of wing, and red on and below costa.

Three specimens: Shovel Mountain, Burnett Co., Texas, F. G. Shaupp; Florida.

Sparganothis tristriata sp. nov.

Expanse 17–23 mm.

Head and palpi: dark ochreous; antenna purplish-fuscous; thorax dark ochreous, patagia wide-red; abdomen light fuscous, anal tuft light brown; legs whitish, powdered with reddish-brown.

Forewing: light canary-yellow, with three wine-red streaks from base to termen. The upper edges, the costa, the middle is above the middle of the wing, and the lower one on dorsum between it and fold, the last is shaded with yellow

along dorsum for inner third. There is a lighter subterminal shade of the same color which joins the outer ends of the three streaks together. The two yellow interspaces are about of equal width to the red streaks. As in *bistriata* there are vertical strigulations of shining irridescent scales, they are more conspicuous on the red streaks, and in the inner part of wing are nearly obsolete on the yellow shades. Cilia yellowish at apex, becoming pinkish at anal angle.

Hindwing: purplish-fuscous, cilia paler; underside gray, with a purplish tinge.

Underside forewing: ochreish-purple, narrowly ochreish along costa, and paler beneath fold.

Five specimens: Duluth, Minn., from C. H. Fernald's collection; Plummer's Island, Md., Sept. 13th, A. Busck. The Maryland specimen is 23 mm., while all of the Minnesota specimens are 5 to 6 mm. smaller.

Cotypes in U. S. Nat. Mus. and Prof. Fernald's collection.

Both this species and the preceding are allied to *S. striata* Wlsm.

Cenopis saracana sp. nov.

Expanse, ♂, 19 mm.; ♀, 20 and 23 mm.

Head, palpi, antenna, thorax and forewing light fawn-brown or light terra cotta; abdomen whitish-fawn, anal tuft light fawn; legs whitish, dusted with dark fawn.

Forewing: light fawn, spotted with dark purplish-fawn. At the extreme base is a shade of the dark color. On the costa at inner third a roughly triangular dark spot; at the outer fourth is a larger darker spot, connecting with a smaller spot in middle of wing, which also connects with a large triangular spot on dorsum at outer third; the three spots with their connecting lines forming an inwardly oblique fascia. The dark markings of the female specimens are larger and more abundant than of the male, the spots of the outer fascia are broader and there is a small dark spot on inner fourth of dorsum in line with the axis of the costal spot above it; there is also a fine strigulation of dark dots on costa between fascia and apex, the outer row of which extends to middle of termen. The forewing of both sexes is strigulated with vertical rows of irridescent dots, of a silvery-bluish hue.

Hindwing: light reddish-terra cotta, white above cell; underside very light fawn, without the reddish hue.

Underside forewing: light yellowish-fawn around the edges, brownish-fawn in middle.

One ♂ and two ♀: Essex County Park, N. J., on hills above Montclair; two flown specimens, July, one bred from larva twisting the leaves of common sassafras; larva found June 13th, moth issued July 6th.

Cenopis karacana sp. nov.

Expanse 18 mm.

Head, palpi and thorax light yellowish-fawn; antenna grayish-terra cotta; abdomen and legs whitish-terra cotta, latter dusted with brown.

Forewing: light yellow, strigulated with vertical rows of shining whitish scales

and marked with light purple spots. The male costal fold, which is very short, and a small shade at extreme base are purple. There is a narrow purple fascia from inner fourth of costa to middle of dorsum, widest on costa and hardly more than a line on lower half. A purple triangular spot on outer third of costa in one specimen sends a fine line to lower third of wing, pointing to anal angle, and two or three small dark dots on costa between the spot and apex.

Hindwing: above and below whitish fawn, cilia the same.

Underside forewing: yellow along costa and termen, white below fold, interior light pinkish-brown.

Two male specimens: one bred from larva crumpling the leaves of bayberry, Anglesea, N. J., June 14th, issued July 9th; breeding No. K. 367; one from larva rolling the leaves of black oak, Essex County Park, N. J., May 30th, issued June 29th; breeding No. K. 224. I have the following notes on the larva of K. 224: "Rolls side of leaf into a tight cylinder; length 12 mm., pale yellow, lighter subdorsal lines on which are tubucules 1 and 2; annulate subspiracular line also lighter. Head jet black, whitish collar separates P. T. shield, which is jet black and large, covering all dorsal area. A long tubecular plate below shield and before spiracle, also a smaller spot at base of leg, jet black. Anal shield nearly round, concolorous with skin, but slightly shining."

Archips brauniana sp. nov.

Expanse 19–22 mm.

Head, palpi, thorax and abdomen brownish-gray, with a darker collar between head and thorax; antenna whitish-gray, annulated above with darker gray; legs whitish-gray, powdered with fuscous.

Forewing: shades of light and dark gray, with three velvety brown spots, forming an oblique fascia from base of dorsal margin to costa at outer third. The ground color is whitish-gray, finely and closely dotted with a darker gray, and slightly lighter on outer end of wing. The male costal fold, which is broad and long, is dark gray. At inner eighth of dorsal margin is a narrow velvety dark brown fascia to middle of wing at inner third, separated from it by a gray shade is a large flattened oblong spot extending from upper edge of cell at middle to anal angle, only the upper edge of this spot is dark brown, all of the lower part being a light grayish-brown; from the dark brown upper part a spur is sent outward. A similar dark brown spot on costa at outer third is separated from the middle spot by leaden-gray shade, edged with whitish gray, this costal spot is twice as long on costa as its vertical thickness, and its lower edge is rounded; from the outer edge of this spot a streak of lighter brown runs into termen at lower third, between this latter and the middle spot is an ovate spot of leaden-gray. There is a black dot in costa before apex and one on termen just below apex, and a broken line of black scales below the latter. Cilia concolorous.

Hindwing: smoky gray, whitish above cell, cilia whitish, with a dark basal line. Underside both wings gray, forewing darker.

Seven specimens: Cincinnati, Ohio, June 15th and 17th, Miss Annette F. Braun; New Brighton, Pa., June 22d, F. A. Merrick.

This species will come next to *Archips grisea* Rob., which its color scheme resembles.

Pandemis pyrusana sp. nov.

Expanse, ♂, 22 mm.; ♀, 26 mm.

Head, palpi and thorax light brown, outer joint of palpi and antenna fuscous-brown; abdomen white, anal tuft and legs yellowish-white, latter powdered with brown.

Forewing: light ochreous-brown, with the usual fascia of this genus of a darker shade. The basal area is defined by a nearly obsolete line from costal fourth to dorsal third, this line is outwardly oblique to a third below costa, between which and dorsum it strongly curved inward; between it and the base are more or less obsolete parallel strigulations. The middle fascia, from middle of costa to before anal angle, is constricted above upper fourth, below which it broadens out and the sides are parallel. The outer costal spot begins at outer third, is semi-ovate, with outer end pointed and nearly reaching apex. The dorsal margin is dusted with blackish-fuscous scales, and this dark shade extends up nearly to middle of wing on the inner half of middle fascia, and slightly above dorsum on the inside of basal line, the dark shade extends around the anal angle into the termen to the apex, overflowing on to the cilia which is of the same color. There is a slight dusting of this dark shade on inner fourth of costa.

Hindwing: shining white, becoming yellowish-brown at apex and with a yellowish subterminal shade, cilia white; underside the same, but the yellowish-brown extends further into the wing.

Underside forewing: light yellowish-brown, or terra cotta, slightly darker below costa on inner half and at termen, cilia blackish-fuscous. In the female the dark shade is not so distinct on dorsal margin, and does not overspread the fascia.

Three specimens: Alameda Co., Cal., Sept., larva on leaves of apple; Alameda Co., Cal., June; Los Angeles Co., Cal., Coquillett.

Cotype in U. S. Nat. Mus.

Tortrix kukakana sp. nov.

Expanse 24 mm.

Head, palpi, antenna and thorax light brown; abdomen light brown, white on first segment and lateral scales on first to third segments; legs light brown, banded and dusted with dark brown.

Forewing: clay-yellow or very light brown, vertically strigulated with dark brown. These strigulations concentrate and form a middle fascia and costal spot before apex. The inner edge of fascia is from inner third of costa to three-fifths on dorsum, the outer edge from middle of costa to dorsum just before angle, the outer line is obscurely defined below. Cilia whitish, tipped with dark brown.

Hindwing: white, speckled with fuscous along dorsal margin, and less heavily along termen, with some scales of same color all over the wing, underside the same, cilia white.

Underside forewing: same as upper side, with dark strigulations repeated, but the fascia and costal spot obsolete.

Two specimens: Kukak Bay, Alaska, July 1, 1899, Harriman Expedition, '99, T. Kincaid, collector.

Cotype in U. S. Nat. Mus.

Tortrix nervosana sp. nov.

Expanse 20–22 mm.

Head, palpi, thorax and antenna light buff-brown; abdomen grayish-fuscous, anal tuft creamy-white; legs creamy-white, dusted with brown.

Forewing: light brassy-brown; all veins, especially strong beyond cell, overlaid with fuscous. Cilia concolorous.

Hindwing: grayish-white, darker above dorsum, cilia whitish; upperside cream color.

Underside forewing: smoky or brownish gray, dull ochreous at extreme edge of costa and along termen, cilia whitish.

Three specimens: Winchenden, Mass., July 5th and Aug. 7th, F. A. Merrick; Scranton, Pa., June 17th, A. E. Lister.

This species is of the shape and general appearance of *T. pallorana* Rob., and may prove to be a variety of it, but can easily be separated by the veins being overlaid with a darker shade.

Tortrix seminolana sp. nov.

Expanse 19–22 mm.

Head and palpi: yellowish-brown, with the outer ends of the scales and outside of palpi reddish-brown; antenna and thorax reddish-brown; abdomen and legs yellowish-brown, the latter dusted with reddish-brown.

Forewing: shining yellowish-brown, finely strigulated with non-shining lines of the same color, towards the costa in inner third the yellowish-brown strigulations alternate with reddish-brown. A central fascia, which is nearly obsolete, except at costa and dorsum, obliquely cross wing from middle of costa to dorsum before angle, it is widest below. The fascia is reddish-brown, overlaid on upper fourth with dark leaden-fuscous scales; there are a few scales of the same color above dorsum. The reddish-brown triangular spot on costa before apex is small and also contains a few leaden scales. Cilia dull reddish-brown.

Hindwing: clay-yellow, cilia paler; underside the same.

Underside forewing: very light golden-brown, with a few darker brown scales on costa near base, and a pinkish-brown shade in middle of wing. In some specimens the leaden scales are not present.

Eight specimens: all collected by Wm. Beutenmüller in Florida.

Tortrix cockerellana sp. nov.

Expanse 21–24 mm.

Head: pale yellowish-fawn, whitish within; antenna light fawn, basal joint darker; thorax light fawn, posterior tuft and outer end of patagia white; abdomen yellowish-white, anal tuft light fawn; legs whitish, heavily banded with dark brown and fawn.

Forewing: light fawn, rather evenly mottled with shining whitish spots in oblique lines. There are ten of the spots on costa between base and apex, the

spots reaching to top of cell; there are three to four rows of horizontal spots beneath the costal spots. The spots are separated by the light fawn ground color, which forms irregular oblique lines. There is a line of black scales from middle of wing in upper third of cell and passing through the end of it between veins 6 and 7, it stops before termen and the black scales on the outer end are more scattered; within the cell, above the black line, are two long and narrow pure white shining spots, the black line rounding the lower edge of each, outside the cell is a similar white spot below the black line, with a short spur of black around the outer edge. There are a few scattered black scales in the fold between inner fifth and dorsum. Cilia shining, whitish-fawn.

Hindwing: above and below pure white, with a few light fuscous scales below costa.

Underside forewing: whitish-fawn, with a pink or flesh-color tinge, paler along costa.

Eight specimens: Glenwood Springs, Colo., Aug. and Sept., received from Dr. Dietz, but probably collected by Dr. Barnes; one specimen, U. S. Nat. Mus., "Colo. 2758"; Lamy, New Mexico, Sept. 17th, Cockerell, No. 5642.

Types in U. S. Nat. Mus.

The appearance of this insect is somewhat like *T. houstonana* Grote.

Tortrix chioccana sp. nov.

Expanse 12–14 mm.

Head: golden-brown and ferruginous; palpi light brown, outer end of tuft on outside shaded with ferruginous; antenna light brown beneath, annulated with ferruginous above; thorax golden brown and ferruginous, patagia darker; abdomen and legs pale ochreish, latter dusted with brown.

Forewing: golden-brown, with the scales frequently tipped with ferruginous and mottled with light fawn. The most conspicuous markings are on costa in upper third of wing; before the middle of costa is a large Indian-red spot, curved on under side, which reaches one-third below costa, in it are two vertical light plum color costal spots; close to base is a smaller Indian-red spot, with a plum color center; between these two is a spot of shining pale fawn, divided by a faint ferruginous line; a similar pale fawn spot is beyond the larger red spot; these two light spots continue as fascia to dorsal margin; beyond this is a wider but narrower Indian-red spot with two faint costal yellowish dots, beyond this and into apex the color is pale yellowish-fawn. In the outer end of wing beyond cell are three or four vertical lines of shining scales, whitish, with a faint lilaceous tinge; in the upper half of this space, between the shining lines, is a deeper red shade, in which are tiny dots or buttons of raised scales. Cilia shining pink, pale ochreish at apex.

Hindwing: cream color within, coppery around margins, cilia the same shade, but shining; underside coppery.

Underside forewing: light coppery-brown.

Four specimens: Palm Beach, Fla., bred by Dr. Dyar from larvæ webbing the leaves of *Chiococca racemosa*; record Nos. 15,485, 15,615, and 15,619.

Cotypes in U. S. Nat. Mus.

This species was determined as *Cacoecia georgiana* Walk., with a query, by Prof. Fernald, for Dr. Dyar's paper on "Notes on the Winter Lepidoptera of Cape Worth, Fla.," Ent. Soc. Wash., Vol. IV, p. 466, 1901.

Tortrix albicomana Clem., and varieties.

I have a large series of fifty or more specimens of this species, and find they separate very nicely into four well-defined varieties, with practically no connecting links. Clemen's type, which is well preserved in the Academy of Natural Sciences, Philadelphia, is of the pale lemon-yellow and ochreous form, with only a trace of the ferruginous shading. I have already described, in Can. Ent., XXXVII, p. 9, 1905, as var. *semipurpurana*, the form in which all of the forewing is very dark purple, except a narrow basal area, a narrow band around termen and apex, and a costal spot of yellow, and now propose the following names to identify the other two varieties.

dorsipurpurana var. nov.

Like type, excepting the extreme dorsal edge is stained with dark purple, enlarging at inner and outer fourth and contracted in the middle.

Three specimens: Chicago, Ill., June, J. H. Reading; New Brighton, Pa., June 22d, F. A. Merrick.

curvalana var. nov.

Like type, except the forewing is overcast with a bright ochreish-red, except at the base, and narrowly on termen, which are yellow, and a round yellowish spot in middle of wing at end of cell. A distinguishing feature of this variety is a wide, sweeping curve from outer third of costa to anal angle, which outlines the ochreish-red area.

Ten specimens: Montclair and Essex Co., N. J., June 14th to 28th; one specimen bred from larva on huckleberry.

I think careful breeding may develop the fact that we have more than one species in the above. Besides huckleberry, they have been bred from rose and oak. I believe there is only one brood. The larvæ are among the earliest in the spring, feeding on young leaves in the bud before they have unfolded.

Phalonia bana sp. nov.

Expanse 12–14 mm.

Head and thorax rich brown, speckled with darker and lighter dots; palpi creamy-brown, dotted with darker scales; antenna creamy-brown, obscurely darker between joints; abdomen dark brown; anal tuft ochreous.

Forewing: rich chocolate-brown, mottled with dark brown especially on costa and outer margin, and with two prominent fasciæ or patches of irridescent pink raised scales.

There is a fascia of pink, broadest on costa, enclosing the basal area. It runs obliquely inward to dorsum. Above the middle it is traversed by two brown strigulæ; adjoining it, on the dorsal margin, is a rounded spot of shining raised black scales, mixed with a few whitish scales. Between this fascia and the base along the dorsum are three small patches of pink scales. There is a long oblique streak of pink scales from the middle of the dorsal margin to the costa. Just before the apex and at the middle of the wing it connects with a large circle of the same scales, which occupies the outer third of wing, and encloses an immense ocellic spot. Beyond this circle there is only a flattened triangular patch of the ground color, heavily overlaid with black, running from the costa at apex to middle of outer margin. Between the inner fascia and the outer line of pink scales the ground color forms a well-defined brown band, with the patch of black and white raised scales at its lower end. The costal edge beyond the middle is tinged with rose pink (not metallic), and between the inner fascia and the apex is marked with six black dashes. About nine small black dots are on the costa between base and outer edge of inner fascia. A fine line of black outlines the lower half of the outer margin above the anal angle. There is a small circle of pink raised scales in the apex enclosing a small spot of leaden-metallic scales. This circle is half in the wing proper and half in the cilia. The cilia is brown and ochreous-brown, heavily overlaid with pink and leaden-metallic scales.

Hindwing brown, cilia paler; underside pale brown with dark brown strigulæ.

Underside forewing deep smoky-brown, with costa thickly dotted with creamy-white spots.

Two specimens: Chicago, Ill., June, J. H. Reading.

Phalonia zaracana sp. nov.

Expanse 13 mm.

Head, palpi, antenna, thorax, abdomen, and legs creamy-white or whitish-fawn.

Forewing: the basal area is whitish-fawn, rather heavily powdered with brown on costa and below it towards base. Its outer edge begins at inner fourth of dorsum, and curving slightly outwardly ends at middle of costa. Following this is a broad reddish-brown fascia; its outer edge begins at outer third of dorsum and ends at outer third of costa, slightly curving inward at upper end. The space beyond is a light ochreous-brown, dusted with darker scales at apex. Cilia whitish.

Hindwing: above and below whitish-fawn; cilia the same. Underside forewing light coppery-brown.

Two specimens: Central N. Y., June 6th, and northern Illinois; both from Dr. Dietz.

This species may be a variety of *P. straminoides* Grote, which it resembles. Beyond the central fascia of *straminoides* is a shade of the same color as before the fascia, distinctly outlining it on both sides. In *zaracana* the fascia and outer part of wing are all dark and in strong contrast to the light basal area.

Phalonia biscana sp. nov.

Expanse 15–23 mm.

Head: light ochreous-brown on top and in front, darker on sides; palpi, inside light ochreous-brown, darker outside; antenna, light fuscous; thorax, light brown, posterior and tips of patagia lighter; abdomen and legs light ochreous, latter dusted with brown.

Forewing: Narrow and pointed, light brown, with several obscure lines and fasciæ of a darker shade of brown; in some specimens these are almost obsolete. In the most plainly marked they occur as follows: from inner fifth of costa obliquely outward to inner third of wing a third below costa; thence equally oblique inward to a third above dorsum, where it disappears. A similar line starts from middle of costa to end of cell, thence inward to dorsum, a little beyond middle. A narrow terminal line running into apex with an indentation a third below costa; a V-shaped mark on outer fifth of costa; cilia concolorous.

Hindwing and underside of both wings shining gray, slightly ochreous along costa of forewing.

Thirty specimens: Essex County Park, N. J., July 15th to Sept. 12th; New Brighton, Pa., Aug. 24th, F. A. Merrick; Dalton, Glenburn, and Carbondale, Pa., July 29th to Aug. 6th, A E. Lister; Orono, Maine, Prof. Fernald; No. 39,455, H. G. Dyar.

Phalonia biscana var. **giscana** var. nov.

Expanse 13–15 mm.

Similar to above, except that the head parts and thorax are a lighter brown, the forewing a light ochreous-brown. The fascia and lines are a fuscous-brown and well defined on the pale ground color.

Eight specimens: Essex County Park, July 24th to Sept. 15th; one specimen from Prof. Fernald; no locality label, probably Orono, Maine.

Phalonia bomonana sp. nov.

Expanse 14–16 mm.

Head: Shining dirty white; palpi dull white, ochreish-brown on outside, apical joint brown; antenna fuscous-brown; thorax dirty white, stained with yellowish in front and at base of patagia; abdomen white with a faint pink tinge; tuft bleached straw; legs whitish, dusted and banded with blackish-fuscous.

Forewing: dirty white, with an inner and outer fasciæ, each consisting of several ochreish-red and reddish-brown spots, separated from each other and outlined by shining white lines. The inner fascia is composed of a round spot on inner fourth of costa, a flattened oval spot in middle of wing, and a shade on dorsal margin. The outer fascia begins as a dark brown streak on outer third of costa, which enlarges into a large oblique oval spot of Indian red, with a horizontal streak of pale ochre through the middle of it. At end of cell, over base of veins 3, 4, and 5, is a smaller spot, and on dorsal margin a triangular spot with its outer angle in anal angle. There is a broad terminal band of dirty yellow and brown; before it, between veins 4 and 6, a similar broader band; between 6 and 7, a long horizontal streak, and a similar shade between 2 and 4; a shade of coppery-red below costa at base. The costa is blackish-brown on the inner fourth.

Between the fasciæ are two dots, and between outer fascia and apex four to six more of the same color. There is a small rounded spot of reddish-brown below costa at outer fifth. Cilia whitish.

Hindwing: dark purplish-gray; cilia white, underside paler; underside forewing dark purplish-gray; the outer half of costa dull ochreous, with a dark spot at end of each vein.

Three specimens: Chicago, Ill., June, J. H. Reading; Hastings, Fla., March 19th, W. G. Dietz, collected by A. J. Brown.

Phalonia ziscana sp. nov.

Expanse 19 mm.

Head: light fawn, shaded with darker above eyes, cream-white, dark fawn on outside; antenna pale fawn; thorax pale fawn, streaked with darker fawn; abdomen and legs grayish-fawn, latter banded and powdered with dark fuscous.

Forewing: light fawn, marked with reddish-fawn and silvery-white lines. There is a streak of reddish-fawn from base to inner fourth between top of cell and costa, its outer edge oblique, and with a darker oblique shade in the middle; below this is a large dark fawn spot, narrow at base, broadening outward, reaching inner third in middle of wing; its outer edge oblique, surrounded by shining white line. In middle of costa a narrow oblique band goes to top of cell; it is darkest on costa. Below is a small, flattened ovate Indian-red spot, circled by shining white at end of cell; below is a paler spot of the same size, below which is a large spot on dorsum, its upper half Indian-red and lower half pale fawn. Both of these spots are enclosed by shining white lines. A line of shining white runs from apex to anal angle; between it and termen is a line of olivaceous-fawn. From the outer fifth of costa a shining white line runs into apex, enclosing a light brown costal spot, and separated from the vertical white line by a small dot of fawn. The light fawn interspaces are more or less streaked with a light olivaceous shade. Cilia light fawn, the lower half preceded by a shining white line which cuts into the cilia.

Hindwing: shining fuscous, cilia paler; underside the same. Underside forewing dark fuscous, lighter along costa, with dark dots at end of each vein.

Two specimens: Hastings, Fla., Feb. 26th, A. J. Brown.

This species, *bomonana* and *obliquana*, are all of the same general design. The arrangement of spots and the colors are sufficiently different to distinguish them.

Phalonia carmelana sp. nov.

Expanse 11–12.5 mm.

Head, palpi, and thorax hoary gray; antennæ yellowish-gray; abdomen light fuscous; anal tuft and legs bleached straw, latter banded and dusted with blackish-brown.

Forewing: whitish-gray, finely speckled with black. Some of these black dots are irregularly arranged in lines, one from outer three-fifths of costa to anal angle and one from outer fourth of costa to lower third of termen; between latter and apex a shorter line from costa. This linear arrangement is not at all constant. There is a shade of pale brown from dorsum at middle to middle of wing. A similar streak crosses veins at end of cell, running into cilia above anal angle,

and a smaller patch before apex; below costa, from base to inner third, is a streak of pale ochreous. Cilia whitish-gray, speckled with black: the black dots are concentrated at the ends of the veins.

Hindwing: light pinkish-gray; cilia paler, with a darker basal line, underside the same. Underside forewing smoky fuscous, with a narrow edging of pale yellow on costa; cilia leaden-metallic.

Twenty-three specimens: Carmel-by-the Sea, Monterey Co., Cal., April, and San Luis Obispo, Cal., March, by Arthur H. Vachell.

Phalonia carmelana var. **obispoana** var. nov.

I have a number of specimens similar to the above, excepting that the brown dorsal and other brown shades are entirely wanting, and in some specimens the black dots are nearly obsolete. I am inclined to think this is a good species, which the discovery of the food plant and breeding will determine.

Fourteen specimens: San Luis Obispo, Cal., March, collected by A. H. Vachell.

Phalonia wiscana sp. nov.

Expanse 17.5 mm.

Head: hoary white, collar faintly tinged with yellow; palpi grayish-white inside, ochreous-brown outside; antenna yellowish-gray; thorax grayish-white, speckled with fuscous; abdomen grayish-fuscous; legs yellowish-white, dusted and banded with blackish-brown.

Forewing: creamy-white, more or less mottled with light wood brown. The basal area is almost uniformly cream-white; its outer edge extends from inner fourth of dorsum to middle of costa. It is very faintly strigulated with pale fuscous, with a darker shade of same color in inner fourth of costa. This is succeeded by a narrow light brown fascia with irregular edges, broadest on dorsum, and ending beyond middle of costa with a darker spot. Beyond this is an irregular creamy-white and mottled fascia, extending on costa to outer fourth and below middle of wing, dividing and sending one fork to middle of dorsum and one to anal angle. The forks enclose a triangular mottled gray-brown dorsal patch. From the costa a narrow curved cream-white band leaves the fascia, reaching termen below middle and follows it to anal angle, where it joins the outer fork of the fascia. It encloses a large oval patch, gray-brown, containing a few black scales in upper end. Beyond the upper half of this curved band, and outlining the apex, is a curved narrow band of brown and black from outer fifth of costa to middle of termen. This is the most conspicuous mark on the wing. Beyond it is a narrow band of cream-white, mottled with pink, outside of which are short brown lines in apex. Cilia whitish towards base and yellowish outwardly, divided by a light fuscous line and marked with fuscous spots at end of each vein.

Hindwing and underside forewing smoky fuscous; underside hindwing yellowish-gray, mottled with light fuscous-brown on upper half and before termen.

One specimen: Milwaukee Co., Wis., F. R. collector, from Dr. Dietz's collection.

Phalonia basiochreana sp. nov.

Expanse 18 mm.

Head, palpi, thorax, and basal area of forewing light ochreous; antenna and abdomen yellowish-fuscous; legs whitish, dusted with blackish-brown.

Forewing: the ochreous basal area extends to inner third on costa and inner fourth on dorsal margin. It is shaded with fuscous at base of costa. There is a large triangular patch of grayish-purple in middle of wing, widest on dorsum, where it extends from yellow basal area to anal angle. It does not reach costa, but ends at top of cell, where the apex of the triangle is flattened. On the middle of costa is a small square spot of grayish-purple, separated from the large lower patch by a yellow line. Below this are two superimposed spots of black surrounded by yellowish-brown. These spots are in the large purple area. Beyond the end of cell is a lunate spot of dull ochreous enclosing a black spot in its upper end. A narrow band of the same color curves outwardly from outer fifth of costa to lower third of termen, thence into anal angle, where it joins the lower end of the lunate spot; this band encloses black spots at costa and above middle. There is a short dash of dull ochreous from costa before apex and an irregular marginal line of the same color from apex to middle of termen. The interspaces between these ochreous bands and spots are grayish-purple, tending to become white below costa; the bands and spots are irregularly outlined with shining white scales. Cilia white with an ochreous tinge, and interrupted by three ochreous spots on upper half, one of which is in apex.

Hindwing: liliaceous-gray; cilia paler; underside whitish, heavily mottled with light fuscous on upper half and before termen. Underside forewing smoky purple; cilia light ochreous, divided by a darker line.

One specimen: Los Angeles, Cal., June, collected by Bevery Letcher.

Phalonia cincinnatana sp. nov.

Expanse 14–16 mm.

Head, palpi, and thorax whitish-gray; antenna yellowish-gray; abdomen grayish-fuscous; legs whitish, banded and dusted with blackish-brown.

Forewing: inner three-quarters whitish-gray, lightly strigulated with light fuscous. A streak of light ochreous-brown from base to inner fourth below costa, and a well defined fascia of the same color from middle of dorsum obliquely outward to upper vein of cell, with a fuscous spot above it on costa. The outer fourth of wing is ochreous-brown, with a darker brown fascia through it from outer fifth of costa to lower third of termen. The narrow terminal line is black. Cilia ochreous-brown, mottled with black.

Hindwing: smoky gray, cilia paler; underside whitish-gray, reticulated outwardly with fuscous. Underside forewing dark ochreous-brown, mottled with ochreous along costa and termen.

Four specimens: Cincinnati, Ohio, April 23d to 30th, Miss Annette F. Braun.

Phalonia discana sp. nov.

Expanse 12–13.5 mm.

Head: light brown on top; face gray-brown; palpi whitish-gray inside, gray-brown outside; outer end of tuft and apical joint black; thorax gray-brown, with four longitudinal black lines; abdomen yellowish-gray; legs whitish, dusted and banded with blackish-brown.

Forewing: gray-brown, sparsely speckled with whitish-gray scales; the extreme costal edge is marked with a number of small geminate pinkish-ochreous spots, separated and divided by short black lines. There is a wood brown fascia in middle of wing, caused by absence of the whitish specks. It is narrow on costa, enlarging below and covering outer end of cell, cut by a line of ground color on fold, leaving a rounded spot below between fold and dorsum. There is a similar patch beyond end of cell, involving anal angle and lower third of termen. A line of black scales outlines it on outer and upper edges, and a similar line cut through it on outer side, paralleling the outer edge. There is a flattened tuft of raised scales in middle of wing at end of cell and another near base of vein eight; also one at anal angle. These tufts, with the outside black lines, form a nearly complete circle, and, as the black lines are finely edged with whitish and a few whitish scales occur in the tufts, the circle, under a low-power glass, appears white. Beyond the black line the apical margin is brown, with a sinuate white edged black line from costa crossing it. Cilia pinkish-gray, with a gray and black spot at end of each vein.

Hindwing: light gray, brownish at apex; cilia grayish-white, preceded by a broad, darker and a thin, paler line; underside the same. Underside forewing smoky brown, dull ochreous, dotted with brown on costa.

Eight specimens: Cincinnati, Ohio, Aug. 17th to 31st, Miss Braun; Plummer's Island, Md., Aug., A. Busck.

Cotypes in U. S. Nat. Mus.

Commophila huachucana sp. nov.

Expanse 22–27 mm.

Head and palpi pure white; a few brownish scales on outer end of palpi, outside; thorax white, with a yellowish tinge; patagia pure white; antenna and abdomen light brownish-white; anal tuft ochreous-brown; legs yellowish-white, dusted with ochreous-brown.

Forewing: basal area pure white, shaded below costa with light fuscous-brown and a few bluish scales. This area extends to inner third on dorsum and nearly to middle on costa. It is toothed outwardly below costa and above dorsum. Beyond it is a broad central fascia of light brown, on which is a horizontal dash of black in middle of wing and a black spot below it. The outer edge is very irregular; a rounded spur leaves it at upper and lower edges of cell and one at dorsum. The outer portion of wing is of the same color as middle fascia, except a large patch of white on upper half, from fascia to outer sixth, which sends a whitish shade to anal angle. The latter is more or less overlaid with light brown, and its outer edge is indented in middle of wing. Before the apex the brown area is rather heavily overlaid with dark brown and black, forming a large crescent-shaped black spot with a leaden band through the middle. The dorsal margin below the fascia and white shade is dotted with black. The termen is mottled with brown and cream-white, arranged in irregular lines. Cilia whitish, mottled with fuscous.

Hindwing: grayish-brown, reticulated with a darker shade; underside grayish-white, heavily reticulated with grayish-brown. Underside forewing smoky brown; outer half of costa spotted and upper half of termen streaked with dull ochreous.

Three specimens: Cochise Co., Ariz., Aug. 1st, from Geo. Franck; Las Vegas, N. Mex., U. S. Nat. Mus.; Huachuca Mountains, Ariz., Aug. 8th to 19th; collector, Dr. W. Barnes; received from U. S. Nat. Mus.

Cotypes in U. S. Nat. Mus.

Phalonia vachelliana sp. nov.

Expanse 13-17.5 mm.

Head: ochreous above and in front, dark brown on side; palpi ochreous, blackish-brown outside; antenna gray; thorax black; abdomen gray; legs yellowish-white, powdered and banded with blackish-brown.

Forewing: inner two-thirds grayish-black, outer third cream color. A shade of light brown and cream, mixed with black scales, crosses the dark area from inner fourth of dorsum to costa; it spreads outwardly below costa to inner third. There is a rectangular black costal spot in middle of light area; in middle of wing below it is a smaller blackish spot, and a third one on dorsum before anal angle. Inside of the latter is a brown spot, outlined with cream-white. The light area is shaded with waves of a slightly darker color and with a shining cream-white line. At the apex is a small blackish shade and a faint spot on costa before apex. Cilia cream-white.

Hindwing: gray; underside darker gray, with indistinct darker dots. Underside forewing smoky black; cilia ochreous, preceded by a broad, blackish line and a narrow ochreous line.

Eight specimens: Cisco, Placer Co., Cal., April and June; collected by Arthur H. Vachell.

Phalonia listerana sp. nov.

Expanse 11-12 mm.

Head and thorax coppery-brown; face, base of antenna, and palpi pale ochreous; abdomen fuscous; legs whitish, dusted with dark brown.

Forewing: base, middle fascia, and fascia before termen coppery-brown, streaked across top of cell with ochreous, and usually outlined with ochreous. The interspaces, consisting of a fascia at inner fourth and one from beyond middle of costa to anal angle, purple madder. The basal area is from inner fifth of costa to inner fifth of dorsal margin, outwardly convex. It is somewhat overlaid with purple madder towards base. The middle fascia is from middle of costa constricted a third below, then broadens to double its costal width at dorsum, where it extends from a little beyond middle to anal angle. The outer brown fascia occupies all of the outer fourth on costa. Its outer edge is straight to lower third of termen; its inner edge, a third below costa, curves outward, then downward to termen above apex. Between this and termen is a narrow band of purple madder, which latter color overflows in the cilia.

Hindwing: smoky black; cilia grayish-white, underside dark gray. Underside forewing dark smoky brown; outer ends of cilia dull ochreous.

Four specimens: Nicholson, Pa., July 4th and 6th, A. E. Lister.

Olethreutes islandana sp. nov.

Expanse 14-15 mm.

Head, palpi, antenna, and thorax light ochreous-brown; thorax darker brown in front; abdomen yellowish-gray; anal tuft pale ochreous; legs yellowish-white; front tarsi banded with blackish-brown.

Forewing: inner half mottled dull ochreous, ochreous-brown, and black in vertical strigulation. The outer edge of this area is a line of black scales from middle of dorsum to outer three-fifths of costa. The outer part of wing is of the same vertical strigulated appearance, but the color is cream-white, the strigulations inwardly are pinkish-yellow, and in outer third shining cream color. At the end of cell there is a small circle of black scales, and a black dot at end of each vein from outer fourth of costa around termen to anal angle. There is a subapical line of black, one dot on each vein. The inner fourth of dorsal margin is rather heavily powdered with black, this streak running to middle of base. Each of the black strigulations begins with a black dot or dash on costa.

Hindwing: brownish-gray, underside paler and reticulated with darker brown. Underside forewing ochreous-brown.

Two specimens: Plummer's Island, Md., May; A. Busck, collector.

Cotype in U. S. Nat. Mus.

Phalonia formonana sp. nov.

Expanse 13–15 mm.

Head: cream-white, brownish on sides; palpi cream-white, ochreous-brown outside; apical joint black; antenna brownish-gray; thorax cream-white; patagia and posterior end of tuft ochreous-brown; abdomen mottled gray and fuscous, tuft dull ochreous; legs cream-white, heavily dusted and banded with blackish-brown.

Forewing: cream-white, with dark central fascia and ochreous-brown outer third. The middle fascia is ochreous-brown, dotted with black on edges of lower two-thirds, and narrowly black on extreme costal edge; its inner edge is from inner third of dorsum to middle of costa. The lower end is broader than the upper. The cream color bordering it on each side is edged with shining scales. The inner fourth of costa is ochreous-brown, dotted with black, with two black dashes between this and fascia. A shade of light ochreous-brown spreads from inner fourth of costa to middle of wing, with a lighter shade overspreading the cream-white except narrowly on dorsum and outer edge of the white area. Between the middle dark fascia and dark outer third is a narrow cream-white fascia, broad on costa, contracted at middle of wing, and broadening again to dorsum, where it is marked with three blackish dots. The outer third contains a large patch of dull ochreous from end of cell, touching costa as a dot at its outer edge and curve of termen at anal angle as two dots. There are two blackish dots, one on costa before apex and one in apex, that send a darker fascia-like streak to middle of wing; the inner edge is outlined with shining white, and the outer edge continues as a shining white streak nearly to anal angle. The upper part of this dark streak is overlaid with leaden-black scales, and a horizontal line of black crosses middle of the whole area from end of cell. Cilia dull ochreous-white by reflected light.

Hindwing: light purplish-gray; cilia whitish, divided near base by darker line. Underside the same but paler. Underside forewing smoky black; costal spots repeated as light ochreous.

Eleven specimens: San Luis Obispo, Cal., March and July, A. H. Vachell.

Phalonia maiana sp. nov.

Expanse 7.5–9 mm.

Head, palpi, antenna, thorax, legs, and abdomen cream-white,—last gray above on outer segments before the anal segment.

Forewing: cream-white, shaded with blackish-brown on inner two-thirds of costa, and four or five dots of same color on dorsum. From middle of dorsum a narrow, outwardly oblique fascia, with parallel edges, goes to middle of wing. From the middle of costa a similar semifascia goes to middle of wing. The inner edge of the costal and the outer edge of the dorsal fasciæ run together. From costa before apex a narrow fascia goes to termen just above tornus, diminishing in width below. Beyond it in apex is a shade of ochreous-brown containing a darker costal spot, and a dark spot in the apex is the beginning of a dark terminal line. There is an ochreous streak through middle of wing from middle to outer fascia. The central and other fasciæ are brown dotted with black, especially along their margins. Beyond and parallel with the dorsal fascia are several blackish dorsal streaks. Cilia mottled, gray, brown, and black.

Hindwing: light brownish-gray, cilia lighter; underside light yellowish-gray, reticulated with light brown towards apex. Underside forewing light brown; between veins, in outer half of costa, cream color; the outer fascia repeated strongly, and the middle fascia lightly in black.

Sixteen specimens: Essex Co., N. J., Great Notch, May 4th to 17th.

Phalonia sublepidana sp. nov.

Expanse 8.5–11 mm.

Head: bright yellow, darker on top; palpi yellow, dusted with darker outside; antenna yellowish-gray; thorax brown, posterior edge and patagia bright yellow; abdomen above fuscous and tuft light ochreous; legs light gray, dusted with brown in front.

Forewing: basal third and terminal fourth bright yellow with horizontal streaks of ochreous. Between these yellow patches is a blackish-brown patch in the form of a large H, the two upper bars touching the costa and there edged with cream-white, the two lower bars touching dorsum. Between these, both above and below the horizontal bar, are patches of ochreous-yellow. The dark color of the figure H is outlined with shining steely-gray scales. There is a subapical line of shining cream-yellow. The inner half of costa is narrowly shaded with brown. Cilia ochreous.

Hindwing: purplish-black, cilia paler, with a broad darker line near base; underside grayish-purple. Underside forewing ochreous-brown internally, ochreous around margins.

Five specimens: Essex County Park, July 4th to 7th; Caldwell, N. J., July 1st to 8th.

This species is close to *lepidana* Clem., and I have had it so labelled with a query for some years, but a recent comparison with Clemen's type in the American Entomological Society's collections proves it to be distinct. I also positively identified as *lepidana* a long series of specimens caught several years ago resting on, and

flying up from when disturbed, common horse-mint (probably *Mentha longifolia*) in Jefferson Co., W. Va., at the end of July. Numerous small Tortricid larvæ were later found in the seeds and dried flower sheaths, but I did not succeed in rearing them.

Phalonia aurorana sp. nov.

Expanse 11–13 mm.

Head: speckled gray and brown; palpi cream-white inside, shaded with blackish-brown below and outside; antenna light brownish-fuscous; thorax light pinkish-white, with a dark pink median streak; patagia grayish-brown; abdomen light gray, anal tuft pale ochreous; legs cream color, shaded with brown in front.

Forewing: shining pink, with obscure ochreous-brown fascia and spots as follows: an outwardly oblique fascia from middle of dorsum to costa beyond middle; a narrow fascia from costa before apex to middle of termen; a rounded spot in lower half of wing above tornus. The lower half of the middle fascia is sprinkled with black scales on both sides. There is a small patch of black scales in middle of subapical fascia, and also on the inner and upper edges of the round spot above tornus. There are a few black scales in the shining pink ground color between the middle fascia and round spot, and above the round spot the inner half of costa is very narrowly edged with black. Cilia ochreous, preceded by a black terminal line, and spotted with five evenly spaced patches of black scales between apex and tornus. The black scales are longer than the ochreous scales of the cilia, and each of the five patches sends a little prominence beyond the outer ciliate line.

Hindwing: very light yellowish-gray, cilia paler; underside the same, with a row of brown dots between veins 5 and 6. Underside forewing smoky brown; outer half of costa dotted with pale pink; ciliate spots repeated.

Eight specimens: Essex County Park, N. J., light trap, Aug. 22d to Sept. 7th; Kennebunkport, Maine, from Dr. Holland's collections, Carnegie Museum, collected by G. H. Clapp, August.

Phalonia voxcana sp. nov.

Expanse 12.5–13.5 mm.

Head, palpi, antenna, and thorax very pale whitish-ochreous; abdomen gray; legs whitish, dusted in front with brown.

Forewing: basal area grayish-white, with a faint pinkish tinge, lightly dotted on costa with brown. Central fascia broadest on dorsum, roughly triangular, reddish-brown, shaded with black on edges of lower half, and a horizontal streak across middle. Beyond this is a large round spot,—the outer edges shining pink, the interior light pinkish-brown, with a horizontal black streak through the middle and an obscure shade of blackish on its outer half. Above this the costa is shining pink, marked with three blackish-brown dots. The terminal edge and cilia are shining pink, shaded with blackish at apex.

Hindwing: gray, cilia very slightly paler; underside gray, mottled on upper half with brown. Underside forewing smoky black; costal and terminal edges dull ochreous.

Four specimens: Hampton, N. H., Aug. 24th, S. A. Shaw; Ottawa, Can., Aug. 16th, C. H. Young; Kennebunkport, Maine, July and August, collected by G. H. Clapp, from the Carnegie Museum.

Phalonia viscana sp. nov.

Expanse 12 mm.

Head, palpi, antenna, thorax, and abdomen light gray, mottled with darker gray; palpi ochreous-brown outside; legs cream-white, shaded with dark brown in front.

Forewing: the basal area is whitish, rather heavily overlaid on and below costa, on dorsal and outer margin and at base with blackish-fuscous. The oblique middle fascia is ochreous-brown, with a whitish dot above and another below middle, both on the outer edge. The outer third of wing is pink, with a brownish-pink fascia through it from costa before apex to middle of termen. This fascia is edged on both sides with shining pink, and the same color edges the inner side of the pink area. Outer third of costa closely spotted with grayish-black. Terminal edge and cilia a uniform shade of ochreous. This shade extends completely around tornus to outer fifth of dorsum.

Hindwing; light gray; underside paler, with a row of blackish dots between veins 5 and 6. Underside forewing smoky black, cilia ochreous.

One specimen: Essex County Park, N. J., May 20th.

Phalonia foxcana sp. nov.

Expanse 11–12 mm.

Head: speckled, whitish and dark gray; palpi whitish inside, grayish-brown outside; antenna gray; thorax speckled brown and gray; posterior end of patagia whitish-gray; abdomen dark gray; legs whitish, dusted with dark brown.

Forewing: almost uniformly dark gray, with a cinereous tinge. There is an obscure outwardly oblique grayish-brown middle fascia and a round spot of the same color between end of cell and termen. The costa before the middle fascia is paler, dotted with blackish-brown; beyond the fascia it is creamy-gray, marked with four blackish dots, and another in the apex, which is followed by five others evenly spaced on the terminal cilia. The dorsal margin is finely dotted with black. The outer round spot is obscurely edged with shining scales. Cilia, between the black spots, speckled light and dark gray.

Hindwing: gray, cilia gray, with a fine whitish basal line; underside gray, mottled with fuscous on upper half. Underside forewing smoky black; costa, between veins on outer half, dotted with cream-white.

Three specimens: Cincinnati, Ohio, Aug. 18th, Miss Braun; Plummer's Island, Md., August, A. Busck.

Cotype in U. S. Nat. Mus.

Phalonia elderana sp. nov.

Expanse 12 mm.

Head, antenna, and thorax light ochreous-brown; palpi cream-white inside, ochreous-brown outside; abdomen ochreous-gray; anal tuft pale ochreous; legs whitish, shaded and banded with blackish-brown.

Forewing: light shining ochreous-brown, with fascia and spots of the same

shade, but not shining. The basal area is vertically strigulated with the dull color. Its outer edge extends beyond third on both dorsal and costal margins. It is succeeded by a dull fascia, twice angulated on both inner and outer edges, and crossed near dorsum by a line of shining scales; above this line on fold is a small cluster of black scales. There is an obscure dull fascia before apex, from costa to middle of termen; this connects with a dull shade above tornus, which sends a streak up to end of cell. Cilia light ochreous-brown, cut at end of each vein with darker brown. The dark color expands on the outer ends of the cilia.

Hindwing: light fuscous gray, cilia paler; underside whitish-gray, with vertical brown strigulations on outer half. Underside forewing light brown, paler around margins; costa and cilia dotted with darker brown.

One specimen: Bred from larva spinning together the young terminal leaves of swamp elder, June 15th, issued July 6th, Anglesea, N. J.

Phalonia nonlavana sp. nov.

Expanse 12.5–13 mm.

Head: whitish, gray on sides; palpi white within, grayish-brown outside; antenna light gray; thorax dark gray in middle, patagia and posterior end tipped with whitish; abdomen grayish-fuscous, with a blackish band on third and sixth segment above; legs whitish, dusted with light brown.

Forewing: basal area outwardly oblique from dorsal third to costa between third and middle; shining whitish, costa marked with black, two long streaks near base and several small ones between these and middle fascia; a row of black dots a third below costa, and a small black dot on dorsum close to base. The middle fascia has nearly parallel edges; it is brown, somewhat broken with whitish ground color below middle, and ending in a blackish costal spot, edged with black lines and angling outwardly. Beyond this is a shining whitish fascia of about the same width, but not sharply defined on either edge. It is somewhat mottled with ochreous-brown and gray and contains two black dots on costa. The outer edge is mottled with black, brown, and gray. A conspicuous fascia starts from costa before apex, reaches termen at middle, continues to tornus, and turns up to middle of wing at end of cell. It is brown on upper third, with three black costal dashes, black in the middle of wing, brown below and on the inner spur, whitish and gray at tornus. There is a brown streak before apex, and the black terminal line is inwardly edged with ochreous. Cilia light ochreous, with an apical and five terminal blackish dashes on the outer ends only.

Hindwing: light gray, underside whitish-gray, spotted with fuscous between veins 5 ond 6; these spots are very faintly repeated above. Underside forewing smoky brown, with five cream-ochreous costal spots and the ciliate spots repeated.

Two specimens: New Brighton, Pa., June 20th, F. A. Merrick; Pittsburg, Pa., June 17th, Henry Engel.

Phalonia toxcana sp. nov.

Expanse 10–12 mm.

Head: white, posterior edge and over eyes shaded with gray-brown; palpi white within, brown speckled with black outside; antenna gray; thorax mottled white and gray, with a transverse, obscure black line before middle; abdomen

shining gray-fuscous, anal tuft dull ochreous; legs whitish, banded and powdered with bronzy-black.

Forewing: pale pinkish-cream, the ground color of the outer third pale whitish-pink. The basal area extends beyond third on both margins. The costa is marked with two small black dots close to base; a large rectangular blackish spot in middle and two or three small dots between the latter and middle fascia. There are two small blackish dots on fold close to base and a larger dot on dorsum near base. The outer edge below fold is speckled with black. The middle fascia begins as a large square blackish spot on costa, obliquely outward; below it, inwardly, an olivaceous fascia continues to dorsum. Its edges are dentate, on the fold and on the outer edge at dorsum are black dots. The blackish middle costal spot sends an obscure streak of black into dorsum before tornus; on the middle of the wing it is interrupted by a patch of shining white, and a similar larger pinkish patch covers the dorsum between the two fascial ends. A conspicuous fascia leaves costa before apex, curving into termen at upper third, diminishing below; is black on costa and before apex, with a small olivaceous patch between and below. It encloses a large spot of shining white, mottled with gray and olivaceous. Above it is a patch of pink with two dark costal dashes. There is a small brown shade in apex, with two dark costal spots before apex on a pink ground. Terminal line black, cilia ochreous, outwardly dotted with black.

Hindwing: whitish-gray, darker around margin; cilia paler; underside the same, shaded and dotted with dark brown below costa. Underside forewing smoky brown, with costal and ciliate spots repeated.

Twenty specimens: Essex County Park, N. J., Aug. 16th to Sept. 11th, light trap.

Phalonia zoxcana sp. nov.

Expanse 8–11 mm.

Head: dark gray; palpi whitish within, dark brownish-gray outside; antenna gray; thorax gray-black, tips of patagia and posterior tuft whitish; abdomen above fuscous, tuft ochreous; legs whitish, banded with blackish.

Forewing: basal area shining, pinkish-white, costal, dorsal and basal margins shaded with olivaceous, and costa dotted with blackish line, a black dot on dorsum near base and a larger vertical streak at lower half of outer edge. The middle fascia is olivaceous-brown, edges irregular, edged with black on costa and a black dash on fold, outwardly, in middle is a short vertical black line. The subapical fascia combines with a black patch before it, in a large rounded black spot, divided by a line of shining gray scales. Below is a patch of olivaceous-brown, and between these dark shades and the middle fascia is an irregular fascia of shining pink, dotted with black on costa and enclosing an olivaceous patch on dorsum, the latter containing three black dorsal dots. Before the black terminal line is a narrow olivaceous brown line, and before this a line of shining pink and gray scales. Cilia divided into four ochreous and five blackish spots of about equal size.

Hindwing: dark gray, cilia paler, with a broad, darker line near base; underside the same, dotted with fuscous between 5 and 6.

Underside forewing: smoky black, with costal and ciliate spots repeated.

Eight specimens: Cincinnati, Ohio, May 21st to June 2d, and Aug. 17th to 24th; Miss Annette F. Brown.

This species is close to *toxcana* K., but can be separated by the extensive black spot in apex.

Carposina comonana sp. nov.

Expanse 16–18 mm.

Head and thorax gray, mixed with brown and black; pale gray within; outside shaded with blackish-gray; antenna yellowish-gray; abdomen yellowish-fuscous, anal tuft pale ochreous; legs grayish-white, front pair heavily powdered with bronzy-brown.

Forewing: narrowly at base and the outer third brownish-gray; between these dark spaces is a wide white fascia, equal in width to half the length of wing; across the outer third of the white area is a curved, light fuscous fascia of spots as follows: on the costa at middle a bronzy-black spot, on top of cell a dark fuscous spot, in upper half of cell a streak and in lower half a larger spot; on dorsum at inner third is a shade of fuscous. A narrow curved line of fuscous parallels the upper half of outer edge of white area. The costal edge in white area is fuscous gray. The dark basal area is widest at costa, curving convexly to dorsum, its widest part is not more than one-seventh the length of wing. The outer edge of white fascia is convex outwardly, starting from costa between middle and outer third, curving to end of cell, thence inwardly to dorsal margin between middle and outer third. The dark area of outer third is marked with an ochreous dash on costa, apex and termen at end of each vein; these dashes are shaded inwardly with black; in the middle of the dark area is a wide streak of black dots, paralleling the edge. At the proper angle the veins in this area are seen to be overlaid with bronzy-brown. Cilia fuscous-gray, sparsely dotted with whitish, and with an ochreous streak from each vein.

Hindwing: light purplish-gray, paler at dorsal edge and base, cilia with a bronzy tinge; underside the same.

Underside forewing: blackish-gray, ochreous spots repeated on outer half of costa, cilia ochreous at base.

Two specimens: San Francisco, Cal.; one from U. S. Nat Mus., no locality, but bearing labels "No. 2617 Apl. 22–82" and "W. knows nothing about it, 1 left. C. V. R. 86."

Cotype in U. S. Nat. Mus.

Encosma boxcana sp. nov.

Expanse 12–18 mm.

Head: ochreous-brown, face darker; palpi pale ochreous, brownish-ochreous outside, apical joint dark brown; antenna fuscous; thorax gray-brown, minutely speckled with ochreous; abdomen and legs grayish-ochreous, latter dusted and banded with brown.

Forewing: gray-brown; upper half finely atomized with whitish-gray, excepting the costal streaks, which are clear brown. There is a large white dorsal spot extending on dorsum from inner to outer third; its inner edge is sharply outwardly oblique, the outer edge is very slighty oblique; the solid white color ex-

tends to fold, but above fold the spot gradually shades into the ground color, disappearing above middle; there are three or four parallel brown lines in this spot, usually extending to fold, but in some specimens one or more are merely dorsal dots. Before and behind this white spot the ground color is darker brown. The costa between middle and apex is marked with five long, clear, brown lines of about equal length; in the most intensely-marked specimens there is a grayish-brown dot between some of the lines. There is a subapical brown line to upper third of termen, with one or two brown dots below it in middle of termen. The ocellic spot is large, shining gray, with a horizontal brown dash above and an inwardly curved brown dash below, the latter in weakly marked specimens consists of an inner and outer dot; the outer and upper sides of the ocellus are defined by a curved brown line, which very faintly connects with the middle one of the group of costal lines. Cilia gray, basally speckled with pale ochreous, and at tornus outwardly tipped with white.

Hindwing: light grayish-brown, darker at apex, cilia grayish-white; underside paler.

Underside forewing: light smoky brown, slightly paler along costa and grayish white below fold.

Ten specimens: Caldwell, N. J., May 17th; Plummer's Island, Md., May 11th, A. Busck; Philadelphia, Pa., June 4th, F. Haimbach; Cincinnati, Ohio, May 18–21, Miss Brown; Kerrville, Texas, Dr. Barnes; Iowa, C. P. Gillette.

Cotype in U. S. Nat. Mus.

Eucosma womonana sp. nov.

Expanse 15–16 mm.

Head and palpi ochreous-gray, latter shaded with fuscous outside, apical joint black; antenna fuscous-gray; thorax gray, patagia brown at base, ochreous-gray outwardly; abdomen cinereous; legs light ochreous, dusted and banded with blackish-brown.

Forewing: blackish-brown, strigulated with whitish-gray on the inner half of the basal area, with an indistinct dorsal spot, and with costal streaks of the same shade. The outer half of basal area is the blackish part of wing, on dorsal margin it extends beyond inner third; the outer edge is indented, inwardly half-way between dorsum and fold, above the fold it is obliquely inward to inner fourth of costa. The dorsal spot in width is less than one-sixth length of wing, it extends to fold, and its inner edge sends an oblique line to inner costal spot. From the outer fourth of costa to apex are five pairs of costal spots, the three inner pairs are subdivided; the second pair send long oblique lines into the inner ocellic bar; the third pair sends lines beneath the fourth pair and curve downward to a leaden spot on margin, above middle; the fifth, or subapical pair, point toward the same spot. On the costa these marks are yellowish-white, becoming grayish-white below, with a few grayish-metallic scales. The ocellic spot is well within the termen, it contains three horizontal black lines, and a black dot below, a broad inner bar, an outer spot above and a dot below of leaden-metallic, edged with whitish. The subterminal line is broad, blackish-brown, finely dotted with yellowish-white, with a white dash below apex, which curves inward and with the outer half of the subapical costal spot, encloses a small round spot of ground color. Cilia shining gray, tipped with yellowish.

Hindwing: smoky fuscous, paler at base, cilia gray, with a broad darker basal line and a faint thin darker line near outer edge.

Underside both wings: grayish-brown; forewing darker and costal spots repeated.

Two specimens: Cincinnati, Ohio, June 9th and July 11th; Miss Brown.

Eucosma walkerana sp. nov.

Expanse 10–12 mm.

Head, palpi and antenna yellowish-gray, palpi darker gray on ends; thorax gray, abdomen light gray, legs whitish-yellow, powdered with brown.

Forewing: basal area leaden-black, a middle white fascia, outer two-fifths pale ochreous, slightly ferruginous in apex, mottled with black and darker lines and dots. The basal area on dorsum extends to inner third, its outer edge is slightly outwardly oblique to middle, then angles slightly inward reaching costa at inner third; it is grayish black, strigulated with darker lines and suffused with whitish near base below costa; the extreme costal edge is marked with five or six whitish dots. The middle fascia is only half the width of basal area and is not sharply defined on outer edge, it is constricted on upper third where it is overlaid with gray and two leaden lines from costa. Beyond it is an ochreous-brown fascia of about equal width, only defined on lower two-thirds of wing, on outside edge above dorsum is a blackish brown spot connected by a line with a short vertical line of same color on inner edge of fascia, below these dark spots the dorsal edge is gray-brown, on the upper third this fascia diminishes to a line at costa. Beyond the white fascia the costa is marked with four white spots, each containing a blackish dash. The ocellic area is pinkish-white, with vertical shining leaden side-bars, the inner connects with the middle geminate costal spot and the outer with the spot before apex, the connecting lines are often obscure and much broken. There is a large triangular patch of a ferruginous-ochreous in the apical fourth, with a few scattered black scales. Terminal line black, distinct only above ocellic area. Cilia shining leaden, tipped with black at apex.

Hindwing: light brown, cilia whitish-gray; underside whitish gray.

Underside forewing: smoky brown, costal spots repeated.

Five specimens: bred from larvæ in hazle catkins, U. S. Dept. Agriculture, breeding No. 2917, issued June 20th to July 9th; I have fifteen specimens from Nicholson, Pa., July 4th to 24th, collected by A. E. Lister. Five specimens: Mountain Lake Park, Md., July 26th, Miss A. F. Braun.

The species is close to *E. transmissana* Walker, and is named in honor of its author.

Cotypes in U. S. Nat. Mus.

Eucosma snyderana sp. nov.

Expanse 28 mm.

Head, palpi and thorax white, speckled with pale olivaceous-gray; antenna white; abdomen gray, anal tuft white; legs whitish, banded and dusted with dark brown.

Forewing: white, overlaid with pale gray, especially between the veins; with a darker basal shade, large dark crescent-shaped spot on lower half of wing before anal angle and a darker terminal patch. The basal area is light brown dotted with dark brown, it is edged outwardly with an oblique line of dark brown dashes, interrupted on the veins, it begins at outer third of dorsum and is defined only to upper third of wing. A gray shade in the upper third of wing extends from base to end of cell. The crescentiform spot is broadest on dorsum, its upper end curving inward, hook-shaped, it is inwardly edged with dark brown dots and a cluster of the same on its outer edge. Before the termen are two vertical irregalar lines of brown dots. There is a large quadrate brown spot in apex, and a similar but paler one on lower third of termen. Costa white, dotted with dark brown. Cilia whitish, gray at base.

Hindwing: light grayish-fuscous, cilia whitish, with darker line near base; underside lighter.

Underside forewing: smoky gray, costa darker dotted with white.

One ♀ specimen: Blackfoot, Idaho, June 3d, Arthur J. Snyder.

Eucosma idahoana sp. nov.

Expanse 21 mm.

Head, palpi and thorax olivaceous-yellow, posterior sides of thorax edged with silver; antenna cream-white, annulated with olivaceous; abdomen light olivaceous-gray; legs whitish, dusted with dark brown.

Forewing: olivaceous-yellow, with horizontal silver lines. The costa, beyond male fold, is silver, interrupted by two spots, one beyond end of cell and one before apex. A line from base to end of cell through middle of cell, a duplicate line above its outer half, the ground color between the two dotted with brown. A silver line on outer half of fold and another the whole length of vein 1*b*. Beyond the cell, between veins 3 and 8, the spaces between veins is silver, the veins being dotted with brown. There is a silver terminal line, edged outward narrowly with dark brown and inward with a line of olivaceous yellow. The apical and subapical spots of ground color are dotted with dark brown, and a line of the same are above and below the silver line in outer fourth of fold. Cilia yellowish-white.

Hindwing: light smoky gray, cilia whitish; underside the same.

Underside forewing: olivaceous-gray, whitish on costal and terminal edge, cilia whitish.

One ♂ specimen: Blackfoot, Idaho, June 3d, Arthur J. Snyder.

Eucosma vomonana sp. nov.

Expanse 15-17 mm.

Head light ferruginous-brown, darker over eyes and around collar, palpi grayish-brown, blackish on outside and outer joint; antenna gray; thorax blackish in center, patagia brown at base, striped with pink and white outwardly; thorax cinereous gray; legs yellowish-white, dusted with dark brown.

Forewing: light gray, with a brownish tinge, the tips of the scales are somewhat paler, giving a speckled appearance under a lens. On the middle of dorsum is a broad white patch, with three brown dots on dorsal edge, it is broadest at base, the inner edge is outwardly oblique, the outer edge nearly vertical, it ex-

tends nearly to middle of wing. Before this white patch is an inverted wedge-shaped black spot, overlaid above with light brown. A darker shade from middle of costa forms a fascia that separates the white patch from a gray ocellic spot, the lower half of fascia is dotted with black. The ocellic spot is edged before and behind narrowly with white and a small spot of white color in middle. The black apical spot and a similar costal spot before apex, continue as brown lines to middle of wing, where they join and continue as a single line to termen above apex, the brown is somewhat dotted with black. The male fold is pinkish-white, dotted with dark brown, the second fourth of costa is dark brown, between the middle and spot before apex it is marked with three whitish geminate dashes. Terminal line blackish-gray; cilia leaden-gray, cut with a whitish streak below apex.

Hindwing: smoky brown, cilia gray, with a light basal line, followed by a darker line; underside lighter, reticulated on upper half.

Underside forewing: dark smoky brown, costal spots repeated.

Six specimens: Cisco, Placer Co., Cal., June 1st; Colfax, Placer Co., Cal., July, all collected by A. H. Vachell.

Eucosma miscana sp. nov.

Expanse 16–19 mm.

Head: light brown; palpi cream color inside, and upper edge, the brush outwardly and at the end, both inside and outside, dark gray; antenna gray, annulated with light brown; thorax black, with a transverse pale ochreous line, the posterior edge and patagia same color; abdomen fuscous; legs yellowish, banded and powdered with blackish-brown.

Forewing: pale ochreous, strigulated with black in basal area, a middle fascia of same color but more heavily and evenly overlaid with black, this ground color in outer half, below costa, is a dusky olivaceous-yellow. Between basal area and middle fascia is a broader whitish-gray fascia strigulated with black. The basal area extends to inner third on dorsum, indented below fold, angling outward on fold, then obliquely inward to inner fourth of costa, but indented at upper third. The whitish fascia, beyond it, begins as a geminate yellow spot on costa, it broadens outwardly to dorsal margin. The ochreous and black fascia extends from middle of wing to dorsum before anal angle. The ocellic spot consists of two vertical bars of pinkish shining scales enclosing a black streak, the bars are nearly joined above and below, and above and before them is another short curved line of the same scales separated from the ocellus by a black dash. There is a similar shining line before termen in middle of wing and below it, in angle, a small spot. Between the shining spots and the dusky yellow streak below costa, the ground color is black, finely atomized with white. At middle of costa are two geminate white streaks, close together, between them and apex are three others, more widely spaced, each encloses a black line, and below upper fourth they change to metallic-blue; the one before apex sends a white dash through the cilia and terminal line below apex; the second and third before costa join and run into the shining line before termen. There is a fine black terminal line, interrupted below apex, and not reaching angle; beyond this line is a line of gray which extends around termen. Cilia pinkish-gray.

Hindwing: light grayish-brown, cilia the same, underside the same, darker at apex.

Underside forewing darker.

Thirty specimens: Cisco and Colfax, Placer Co., California, June and July, A. H. Vachell.

Thiodia kiscana sp. nov.

Expanse 12–13 mm.

Head, palpi and thorax white, a light fuscous spot on outside of palpi near base of second joint, and a shade of the same color, both inside and outside, at end of second joint, patagia shining grayish-ochreous; antenna white, finely annulated with fuscous; abdomen grayish-fuscous; legs white, tarsal joints ringed with blackish-brown.

Forewing: pale fawn, with a darker shade in middle of wing from base to end of cell, and another on upper half of wing from before end of cell into apex. The inner half of costa is narrowly blackish, edged internally with white, beyond the middle are four large black streaks and four fine black dashes on a white ground; all outwardly oblique, excepting the white line before the light brown apical spot, which is inwardly oblique, and is edged with blackish scales on each side; the white line, from between the two middle large spots, runs obliquely outwardly and nearly connects with the white line before apex. The ocellus is large, lustrous, white, with a long black line above and one or two shorter ones below it. Below the fold the dorsal margin is sparsely overlaid with white scales. The terminal edge and cilia are light gray, finely powdered with blackish dots.

Hindwing: light gray, smoky towards termen; underside whitish-gray.

Underside forewing: smoky ochreous-brown, costal spots repeated.

Ten specimens: Cincinnati, Ohio, May 27th, Miss Annette F. Braun; Greenwood Lake, N. J, June 10th; Gloucester Co., N. J., May 29th, F. Haimbach.

Epinotia dietziana sp. nov.

Expanse 13–15 mm.

Head: pale ochreous on top, basal joints of antenna, face and palpi white, latter shaded with brown outside; antenna whitish brown; thorax grayish-white above, beneath and tuft white; legs whitish, dusted and banded with blackish-brown.

Forewing: a broad white fascia between inner fourth and middle on costa, enlarging below top of cell and reaching inner fourth to outer third on dorsum. The basal area is gray, with a whitish transverse streak through middle and edged outwardly with black; there are a few black scales on the inner edge of the white streak. The broad white fascia is dotted on costal and dorsal edges with gray; beyond it is a gray fascia, beginning at middle of costa as a blackish spot, continuing to middle of wing as a gray line; at end of cell, in middle of wing, is a small black spot, this is continued as a broader gray fascia to dorsum before anal angle. The space beyond is white, inwardly overlaid with gray and outwardly bordered by dark ochreous-brown, the latter color in a shade beneath costa for outer fourth and running into a conspicuous black ocellic spot. The outer half of costa is marked by four pairs of white oblique lines, divided by narrow black lines, and each pair separated by a larger black spot. The ocellic

area is shining white, with a vertical row of brownish scales. Termen above middle is bordered by a fine black line running into apical spot. Beyond this is a narrow yellowish line in cilia, the latter is blackish with ochreous brown tips.

Hindwing: smoky gray, preceded by a faintly lighter basal line; underside the same, cilia concolorous.

Underside forewing: smoky brown, with the geminate whitish spots repeated on costa.

Twenty specimens: Hampton, N. H., May 28th to July 3rd, S. Albert Shaw; Hazleton, Pa., at electric light, May 19th to June 8th, collected by W. G. Dietz, M.D., and to whom I am indebted for a hundred or more very interesting Tortricids.

Cydia colorana sp. nov.

Expanse 22–24 mm.

Head and palpi clay-white; antenna leaden-fuscous; thorax leaden-fuscous, tips of patagia and posterior edge of thorax white; legs cream-white, lightly dotted with fuscous.

Forewing: ground color, base of scales fuscous-brown, outer half gray to pinkish-ochreous, under a lens as a finely reticulated surface of alternate dark and light vertical lines; below the fold of wing the light tips are gray, becoming ochreous above outwardly and shaded with pink on the outer half above the middle. The ground color is traversed by numerous irregular broken lines of shining leaden scales. The costal edge is narrowly cream-color, with a small black spot beyond middle and four larger ones between it and apex. From the cream-color spaces between these spots the leaden lines begin; the two before apex extend only to upper third, and a single line begins close to termen at middle of wing, and continues to anal angle; before these ante-apical streaks are two others which join at middle of wing and continue to anal angle as a single line, dotted inwardly and outwardly with black below the middle. The other leaden streaks are edged with black dots more or less, usually on their inner sides. The terminal line is black, before which is a pale ochreous line. Cilia shining gray.

Hindwing: smoky gray, whitish above cell, cilia whitish, with a gray line near base; underside the same.

Underside forewing: smoky brown, costal edge yellowish, and a line of same color preceding a blackish terminal line.

Four specimens: three, Glenwood Springs, Colorado, June 1st, Dr. Wm. Barnes, received from U. S. Nat. Mus.; one, Salida, Col., June 19th, "Hulst collection" from Dr. Dietz.

Cenopis chambersana sp. nov.

Expanse 22–25 mm.

Head: ochreous-brown, a shade darker on the anterior edge of the frontal tube; palpi pale ochreous within, outside ochreous-brown, darker at end of tuft; antenna light grayish-ochreous: thorax ochreous-brown, darker than head, posterior end of patagia paler; abdomen yellowish-white, with white scale tufts on first segment above; legs yellowish-white, powdered with bronzy-brown.

Forewing: light ochreous-brown, vertically strigulated, shining purplish-brown,

with several lines and spots of the same shade as follows: below costa at outer fourth is a spot from which a fine line crosses wing obliquely to dorsal edge beyond middle; at end of cell, below middle of wing, another spot which sends a line into dorsum before angle; from a dot at outer third of costa an irregular line curves outward and downward ending in tornus; a faint terminal line. The costa is evenly marked with the upper ends of the reticulations. There is a very short but broad costal fold in the male. Cilia concolorous, shining, with a faint pinkish tinge.

Hindwing: white, lightly stained with ochreous on outer half, which color runs into the cilia; underside pale ochreous.

Underside forewing: light ochreous-brown, with darker reticulations on costa.

Ten specimens: Cincinnati, Ohio, June 12th to July 6th, Miss Annette F. Braun.

I take pleasure in dedicating this species, which differs from any *Cenopis* known to me, to the one of the two pioneers in North American Micro-Lepidoptera, and whose interests and labors were so largely associated with the place of its habitat, V. T. Chambers.

Eulia niscana sp. nov.

Expanse 15–17 mm.

Head: light brown, shaded on sides with darker ferruginous-brown; palpi blackish-fuscous, underside at base pale ochreous; antenna dark fuscous, annulated with yellowish-white; thorax dark ferruginous-brown, patagia and posterior end light ferruginous-brown; abdomen cinereous; legs light ochreous, dusted with brownish-fuscous.

Forewing: reddish-brown, crossed by three narrow shining white fasciæ. The inner is from first quarter of costa to before middle of dorsum. The middle one from middle of costa to anal angle, where it coalesces with the lower end of outer fascia, which starts on costa before apex as a geminate spot; in some specimens this fascia is broken below costa. The white fasciæ are outlined with black scales in the middle of wing, and a dot of black scales in the middle of wing and a dot of black is enclosed in the middle fascia, at end of cell. The edges of the fasciæ are irregular. Between the inner and middle fascia there is a shining patch of pinkish scales on the lower half of wing. The dorsal margin is narrowly dotted with black. Cilia at apex dull brown; below apex, white at base, shading into dull ochreous outwardly.

Hindwing: gray, cilia whitish-gray, with a darker line near base; underside gray, smoky gray below costa.

Underside forewing: smoky brown, with a large middle, and before apex, a smaller geminate costal spot of cream white.

Three specimens: Carmel, California, June, collected by A. H. Vachell.

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ERRATA.

Page 2, line 19, for **sinicolana** read **pinicolana** Dbld.
" 2, " 19, " **buolana** read **buoliana** Schff.
" 5, " 6, " record *read* record.
" 11, " 1, " **rosaschreana** read **rosaochreana.**
" 11, " 32, " Lell *read* Zell.
" 16, " 43, " A. T. Brown *read* A. J. Brown.
" 22, " 3, " **circula** *read* **circulana.**
" 23, cancel lines 2 and 3.
" 31, " 39, " wnite read white.
" 31, " 43, " spade *read* shade.
" 38, " 25, " **distinctana** read **essexana.**
" 45, " 15, " Salidago *read* Solidago.
" 51, " 18, " **Epinotis** read **Epinotia.**

DATE OF PUBLICATION.

As a matter of record it may be stated that each eight pages of this paper have been issued as "Signatures" and mailed to the following five gentlemen on the dates as tabulated: C. H. Fernald, Ph.D., Amherst, Mass.; James Fletcher, L.L.D., Ottawa, Canada; Henry Skinner, M.D., Philadelphia; William Beutenmüller, New York; William G. Dietz, M.D., Hazleton, Pa.

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Pages 1–8	February 1, 1907	February 2, 1907
" 9–16	" 5, "	" 6, "
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" 89–98	" 26, "	" 27, "

SOME NORTH AMERICAN DIPTERA FROM THE SOUTHWEST.

BY E. T. CRESSON, JR.

PAPER II.

TRYPETIDÆ.

(Plate I.)

As mentioned in Paper I (published in the Trans. Am. Ent. Soc., XXXII, Sept., 1906), this material, with a few exceptions, was collected by J. A. G. Rehn and H. L. Viereck, chiefly in New Mexico, during the summer of 1902; also a few species collected in Mexico by J. F. McClendon in the summer of 1903.

I have figured the wings of several described species, because they have never been given, and I think every description, especially of the *Tephritis* group, to be of value, should have a good figure of the wing. When this group is monographed, no doubt there will be many synonyms, at least varieties, established; many on account of the reliance placed upon the description of the wings which have not been figured.

The genera *Ensina*, *Tephritis* and *Euaresta* are very poorly defined on account of their transmutation, and the only satisfactory way to treat them is to place them under *Tephritis*, making the former and latter subgenera. In this paper I have not considered the genus *Ensina*, excepting *E. humulis* Lw., but have placed under *Tephritis* all species having the *Tephritis* wing design. I separate *Euaresta* according to Coquillett, but it is not very satisfactory; even Loew in his Monograph states that he is doubtful as to the validity of this genus.

Strauzia longipennis Wied., var. Pl. I, fig. 1.

One male, East Las Vegas, N. Mex. Length 6 mm.

Entirely yellow, excepting black spots as follows: one including the ocellar tubercle, two on the anterior dorsal margin of thorax separated by a narrow yellow line, one on each lateral angle of the thorax, two on the brown metanotum next to the abdomen. The outer verticals and the two upper frontal pair of bristles incrassate

and truncate, but not enlarged at tip; the two lower pair much stronger than all the others, of which the upper pair is one and one-half again longer than the next lower. All bristles and hairs black. The wing as figured.

Strauzia is the original name of this genus, which Loew called *Straussia*, as being a more correct form. Whether good or poor form, Desvoidy's name *Strauzia* has the priorty, and I therefore follow Coquillett in re-establishing the original name.

Strauzia diffusia Snow.

One of each sex. East Las Vegas, N. Mex.

Spilographa obfuscata v. d. W.

One male, Guadalajara, Mex. (McClendon).

Agrees well with the description, excepting that the antenna reaches to the lower third of face. The thorax is black, but appears cinereous from the pollinose coating. The abdomen is grayish-pollinose on the middle of the dorsum and along the posterior margins of the segments, but there is a non-pollinose black spot in the middle of each segment, forming a median dorsal stripe. Knobs of halteres black. The band passing over the small cross-vein is the widest band on the wing, but does not meet the next band at the posterior margin; and the latter band, which passes over the posterior cross vein, is represented only by spots at the second, third, fourth and fifth veins. The small cross-vein is before the middle of discal cell. The basal band is not distinct below the first basal cell, except as a spot at the acute apex of anal cell.

Plagiotoma obliqua Say.

Three males, Alamogordo, N. Mex.; one male, Guadalajara, Mex.

Only one spot on the pleura, and that at the base of the halteres. The posterior part of the thoracic dorsum shining, in contrast with the yellow dusted anterior portion. Apex of scutellum with a brown spot. Length 4 mm.

The male from Mexico has the thoracic dorsum entirely yellow pollinose. Scutellum without apical spot. Pleura blackened about the base of halteres, and the hind coxæ extending to the metanotum. Abdomen with two black spots on the lateral margins of fourth segment. Length 4½ mm.

This latter seems to approach Loew's Brazilian variety referred to in his Monograph, page 251.

Neaspilota alba Lw.

Seven males and one female, Alamogordo, N. Mexico.

These specimens are so well marked, I think it will not be out of place to note such here.

Generally sulphur-yellow ; dorsum of the thorax, in part, metanotum, excepting the sides, a large triangular spot on the lower part of the sternopleura and a smaller spot on the hypopleura above the hind coxæ, black, more or less obscured by whitish pollen. The black area of the thoracic dorsum is limited mostly to the anterior part, and a narrow extension each side of a rectangular area which includes the two pair of dorso centrals. Sometimes this black area is contracted, leaving the lateral margins and the greater part of the posterior half of the dorsum, yellow. The bases of the second and following abdominal segments brown. The antennæ, especially the tips, the tip of the proboscis, the extreme bases of the wings, the halteres and the legs, rufous or reddish-yellow. Stigma entirely or only at its base brownish.

Acuira insecta Lw.

One male, Guadalajara, Mex.

Entreta sparsa Wied.

One male, Cloudcroft, N. Mex.

Ensina humilis Lw.

One female, Highrolls, N. Mex.

Tephritis clathrata Lw.

One male, Guadalajara, Mexico.

The antennæ scarcely reaching the oral margin. The apical bristles of scutellum minute; the lateral ones very long. The abdominal spots brown. The wing reticulation very distinct, even below the fifth vein.

Tephritis finalis Lw.

One male, Guadalajara, Mex.

Head and palpi light yellow; antennæ more rufous ; thoracic bristles brownish ; humeri and a band to base of wings yellow ; scutellum entirely yellow, the bristles brown, the lateral pair are the longest on the insect, the apical pair decussating ; the abdomen more shining black ; the first segment and posterior margins of all yellow;

the fourth segment as long as the second and third together, the yellow of its posterior margin extending in form of a median wedge nearly to its base, the genitalia yellow; legs pale yellow; wings typical, but the spots smaller, and more numerous in the first posterior cell, one being at its extreme apex.

Tephritis murina Doan.

Numerous specimens of both sexes, Cloudcroft, Beulah, and Las Vegas, New Mexico.

As Mr. Doan remarks, this species resembles *T. albiceps* Lw. in the wing design, but the latter is readily distinguished by the formation of the marginal drops at the apex of the wing, and the next inner row, which are concentric with them; also the interspersing of minute drops among the larger discal ones. The wing also is narrower in proportion than in *albieeps.*

I have before me a few specimens of *murina* showing a tendency of the apical drops to arrange themselves concentrically as those of *albiceps.* The absence of the black abdominal markings, except with the females is not constant, but where present are rather faint.

Dr. Coquillett has kindly confirmed the determination of my specimens.

Tephritis dupla sp. nov., Pl. I, fig. 2.

Male.—Front rufous, darker along the orbits and at vertex; narrow anteriorly, nearly one-half as wide as at the vertex; bristles black. Face yellow, whitish along the orbits. Palpi and proboscis yellow; labella genticulate. Antennæ rufous, three-quarters the length of face, stout; third joint rounded at apex, cylindrical. Occiput, except the posterior orbits and behind the cheeks, black.

Thorax and scutellum black, with the usual bristles and whitish hairs, grayish-pollinose; the former with three dorsal and two lateral brownish lines; the latter brownish at apex, with four bristles.

The abdomen more shining, black. All femora black; fore and middle tibiæ, extremities of hind tibiæ, and all tarsi rufous. The stigma of wing and the adjacent part of margiual cell infuscate; no spot in stigma; small cross-vein infuscate; only two spots in the marginal cell; third vein bare. Length 2.5 mm.

Two males, Beulah, N. Mex. Cotype in Acad. Nat. Nat. Sci. Phila., and Univ. Kans. collection.

The two large spots in the marginal cell, with the uniform reticulation of remainder of the wing is very characteristic.

Tephritis umbrata sp. nov., Plate I. fig. 3.

Male.—Front yellow, orbits narrowly white; bristles black. Face and cheeks whitish, cheeks with a long bristle opposite the lower angle of eyes. Oral mar-

gin with long white bristles, longest towards the occiput. Occiput blackish, pollinose above; all its bristles white. Antennæ light yellow, reaching to within one-half the length of second joint from the oral margin; third joint rounded at apex; arista brown. Palpi and proboscis yellow.

Thorax black, whitish-pollinose, bristles black, sparsely clothed with short white bristle-like hairs, longest on the pleura; dorsum with three faint brownish stripes, its bristles very long. Scutellum like-colored, with the thoracic stripes extending to its apical margin; four bristles, the lateral pair very long reaching as far as the stigma of wing.

Abdomen like-colored, with whitish hairs; two brown spots on the dorsum of each segment; bristles on the posterior margin of fourth segment black. Halteres reddish-yellow. Squamulæ whitish.

Legs in general reddish-yellow, but all coxæ, the upper surface of the basal half of fore femora, middle third of middle femora and the basal two-thirds of hind femora blackish; all bristles brownish, the longest on the fore femora.

Wing with the stigma, adjacent portion of marginal and submarginal cells, small cross-vein, and posterior cross-vein, infuscate; a spot in the stigma, three in the marginal cell, and the extreme bases of the marginal and submarginal cells, hyaline; spots in the first posterior cell small, except the large conglomeration in the apical portion. Length 3 mm.

One male, Guadalajara, Mexico. Type in Acad. Nat. Sci. Phila. collection.

Allied to *T. inornata* Coq., but the spots on the abdomen (which I do not think is a constant character), the partly blackish legs and the more numerous spots in the submarginal and first posterior cells will distinguish this species.

Tephritis corpulenta sp. nov., Pl. I, fig. 4.

Male.—Head yellow, except the black upper portion of occiput, and the whitish face and cheeks. The frontal, two vertical, and two ocellar bristles, black, all others and hairs white. Antennæ reaching to within the length of second joint from the oral margin; arista brown.

Thorax cinereous, bristles black, hairs white. Humeri and a line to base of wing yellowish. Metanotum black. Scutellum apex narrowly yellowish, with four bristles. Halteres light yellow.

Abdomen cinereous, as broad as long, and broader than the thorax; hairs white; bristles on the posterior margin of fourth segment black.

Legs rufous, except the upper side of fore femora, the basal third of middle, and all of hind femora, except the knee, black. Wing brown, as figured. Length 3 mm.

One male, Cloudcroft, N. Mex. Type in Acad. Nat. Sci. Phila. collection.

Approaching *Ensina despecta* v. d. W., but the broad band extending from the stigma to the posterior cross-vein is more distinct, only two large spots in the submarginal cell; the large spot in the

discal cell opposite the posterior cross vein much smaller; one less spot in the second basal cell. The abdomen is noticeably rounded, not pointed at apex.

Tephritis fibulata v. d. W.

One female, Las Vegas, N. Mex.

This species is figured in the Biologia, Diptera, Vol. II, and the specimen before me agrees well with it, but the small cross-vein is clouded; the extreme apical spot of the submarginal cell wanting; two small spots in the stigmatic cloud of the submarginal cell; the two small spots in the discal cell near the posterior cross-veins wanting, but the large spot before them is nearly divided into two. The ovipositor is nearly as long as the abdomen. The markings of the thorax and abdomen distinct.

Tephritis inornata Coq., Pl. I, fig. 5.

One male, Beulah, N. Mex.

The yellow legs. The triangular group of three spots in the apical portion of the submarginal cell, though they sometimes coalesce into one; the quadriangular group of four spots in the basal portion of the first posterior cell, though they also sometimes coalesce into one large spot or two elongated spots; and the five or six smaller spots in the apical portion of the first posterior cell are characteristic of this species, in addition to the typical description.

Tephritis pallidipennis sp. nov., Pl. I, fig. 6.

Male.—Head yellow, but the ocellar tubercle and upper part of the occiput black. Front about one-third the width of head; orbits nearly parallel, narrowly silvery. Face whitish. Palpi and proboscis whitish. Hairs of occiput and cheeks white. Antennæ four-fifths as long as the face, whitish; second joint more yellow; arista brown, yellow at base.

Thorax black, golden pollinose towards the posterior dorsal margin, covered with short white hairs; humeri and at base of wing yellowish; pleura and metanotum whitish-pollinose; two posterior dorso-central bristles. Scutellum black, with four marginal bristles, the two apical one-half as long as the lateral ones. Halteres yellowish.

Abdomen short, broad, grayish-black; a faint brown stripe each side of a median gray line; the white hairs longer than those of the thorax.

Legs yellow; fore femora more or less faintly infuscated. Wings nearly hyaline; first vein bristly; third vein bare, faintly spotted along the costa and in cells behind the fourth vein; the darkest portion is along the costa in form of triangular spots; the submarginal cell cleary hyaline, except at the apex; the first posterior cell very faintly spotted along the fourth vein. Length 2.5 mm.

Two males, Mainton, Colorado, 6029 feet altitude (E. S. Tucker). Cotypes in the collection of Acad. Nat. Sci Phila. and Kans. Univ.

This species is remarkable for its nearly hyaline wings; the spots, except along the costa, are hardly distinguishable and then only when observed in certain angles with the light.

Tephritis despecta v. d. W., Pl. I, fig. 7.

One male, Highrolls, N. Mex.

The wing as figured in the Biologia, but less distinct towards the base, and the spots in general are larger. It agrees well with the description.

Euaresta bella Lw.

One female, Guadalajara, Mexico.

No bristles distinguishable on the third vein.

Euaresta timida Lw.

One female, Guadalajara, Mexico.

The abdomen entirely rufous, except a black spot near each lateral posterior margin of the fourth segment. The ovipositor with first joint as long as the last three segments. The third vein distinctly bristly.

Euaresta webbii Doan.

One male, Beulah, N. Mex.

Fore femora above, middle femora below and hind femora entirely black; otherwise the legs rufous.

Euaresta pura Lw., Pl. I, fig. 8.

Two females, Beulah, N. Mex.

Both of these specimens are wanting a head; otherwise they agree with Loew's description, excepting the wing picture, which in these the first basal cell sometimes has one small drop, and the first posterior cell has only one in its basal, besides the three in its apical portion.

Euaresta tapetis Coq., Pl. I, fig. 9.

Three females, East Las Vegas, N. Mex.

Euaresta araneosa Coq.

One male, Beulah, N. Mex.

Beyond a doubt *Urellia pacifica* Doan (Jour. N. Y. Soc., vii, 192,

1899, pl. 4, fig. 10), is a synonym of this species. The typical description and wing design agrees with this specimen, which I compared with the typical *E. araneosa* at the National Museum. The basal spot of the first posterior cell in the typical specimens is sometimes expanded the full width of the cell and nearly to the small cross-vein, making the stigmatic band narrower.

The typical description of *E. araneosa* is not explicit enough as to the wing design, and the reference to figure 21, plate 10, of Loew's Monograph is to me entirely misleading. Figure 4, plate 11, is nearer to it, excepting for the apical rays. This demonstrates the danger of describing a Trypetid wing without figuring it.

Euaresta abstersa Lw.

Numerous specimens of both sexes, Alamogordo, N. Mex.; Cloudcroft, N. Mex.; El Paso, Tex.; Ysleta, Tex.

Urellia mevarna Walk., Pl. I, figs. 10 and 11.

Numerous specimens of both sexes, Highrolls, Alamogordo, Las Vegas, and Cloudcroft, N. Mex.; El Paso, Tex. One male, Guadalajara, Mex.

The first ray, from the stigma to the large spot, is sometimes hardly distinguishable; only one ray to the discal cell; the small cross-vein faintly or not at all infuscated, sometimes a small spot on the fifth vein. Dr. Coquillett kindly determined these for me.

Urellia radifera Coq., Pl. I, fig. 12.

Three males, Cloudcroft and Alamogordo, N. Mex.

Dr. Coquillett kindly determined these for me.

Urellia stigmatica Coq., Pl. I, fig. 13.

Numerous specimens of both sexes, Alamogordo, N. Mex.

Dr. Coquillett kindly determined these for me.

Urellia eugenia v. d. W.

One male, Guadalajara, Mex.

Urellia vicina v. d. W.

Three males and ten females, Alamogordo and Highrolls, N. Mex.

The first ray stout; one ray to the discal cell; the small cross-vein infuscated.

MYDAIDÆ.

Etyphus townsendi Will.

Numerous specimens of both sexes from Alamogordo, N. Mex. (Viereck and Rehn).

From this lot of well-preserved specimens I make the following notes, which will also serve to distinguish the sexes.

The pile of the male is much thicker than that of the female, and in some places longer ; that of the thoracic dorsum more appressed and formed into four longitudinal stripes by a narrow bare black median vitta, which extends from the anterior margin to quite some distance from the scutellum, and also by two lateral ones, extending from the humeri to the scutellum. The lateral pollinose spots behind the humeri are sometimes indistinct, but in every case is more distinct in the female than in the male; the dorsum of the female is also marked with two other fainter median pollinose stripes. The pleuræ of both sexes have, in addition to those of the sterno- and mesopleuræ, similar silvery spots on the hypopleuræ and on the rufous anterior lateral angles of the first abdominal segment. The abdomen of the male opaque, at least not polished as in the female, except the yellow posterior margins, and these bands are narrower and that of the first segment more whitish than those of the female; the last segment shorter than the preceding. The legs of both sexes sometimes brownish, especially the femora ; the hind tibiæ of the male with a distinct apical spine, at the base of which are one or two stout bristles ; of the female, in place of the spine is a tubercle, on which are three or four stout bristles. The wing veins of both sexes are sometimes brownish, especially towards the anterior margin. Otherwise they agree with the typical description in Trans. Kans. Acad. of Sci., xv, 58.

Mydas abdominalis Adams.

A male and female, Florence, Arizona (Beiderman).

Mydas cletpis O. S.

One female, Carr Canyon, Arizona (Skinner).

Mydas luteipennis Lw.

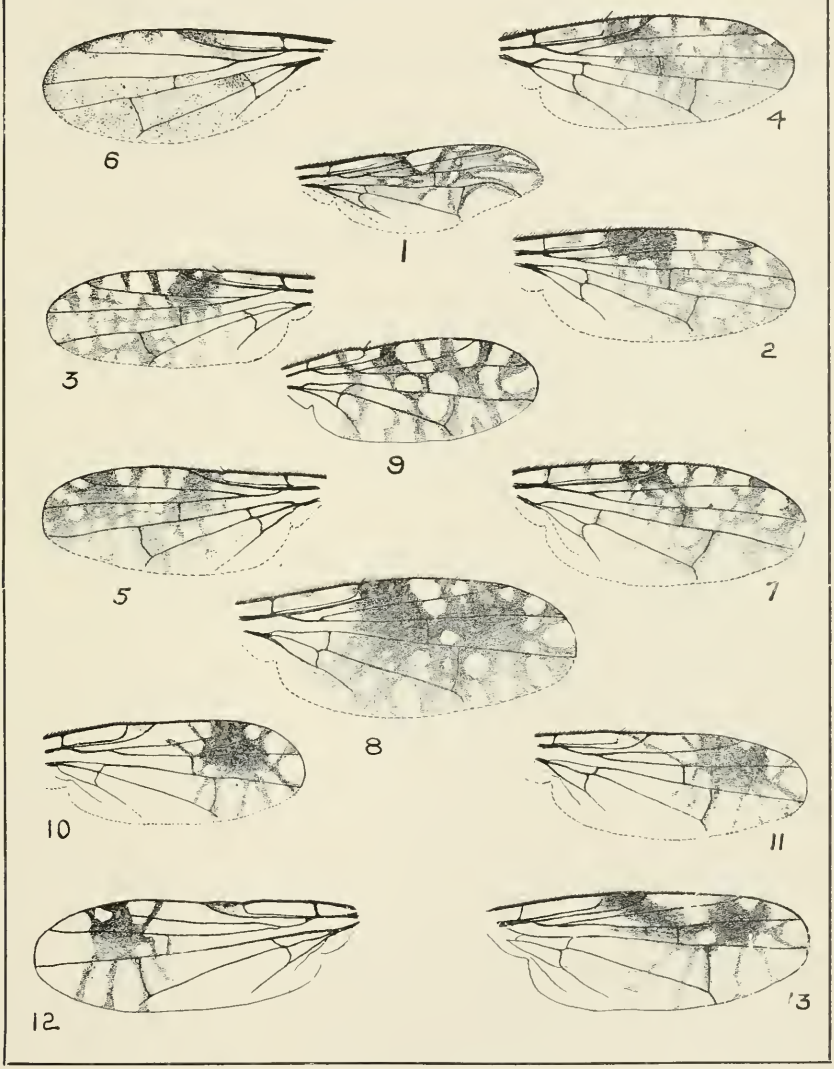
One male and female, Alamogordo, N. Mex (Viereck and Rehn).

I make mention here of a male from Round Mt., Texas, closely allied to *Mydas dives*, but the abdomen is opaque-black, with only a

tinge of metallic-blue; no golden pile on the second segment; the alulæ, the lateral angles and the root of the wing blackish-brown, and the posterior margin brownish-hyaline.

EXPLANATION OF PLATE I.

Fig. 1. *Stranzia longipennis*, variety, wing.
" 2. *Tephritis dupla*, wing.
" 3. " *umbrata*, wing.
" 4. " *corpulenta*, wing.
" 5. " *inornata*, wing.
" 6. " *pallidipennis*, wing.
" 7. " *despecta*, wing.
" 8. *Euaresta pura*, wing.
" 9. " *tapetis*, wing.
" 10. *Urelia mevarna*, wing.
" 11. " " variety, wing.
" 12. " *radifera*, wing.
" 13. " *stigmatica*, wing.



CRESSON ON DIPTERA.

THE NORTH AMERICAN SPECIES OF THE DIPTEROUS FAMILY SCENOPINIDÆ.

BY E. T. CRESSON, JR.

SCENOPINIDÆ.

(Plate II.)

In working over some material from Mexico and the southwestern United States, I found some species of this family that appeared new to me, and it being a small family I thought it a good opportunity to make a short revision of the family, as known to North America, comprising notes and a few descriptions of undescribed sexes.

This paper is intended to be of use, especially to the student who has not the collection or library at his disposal needed for the determination of the species of this family. The tables will aid in separating the genera and species.

The figures given here were drawn, mostly, from these southwestern species, and will help in the generic descriptions; and the data given, except where otherwise mentioned, is from the material in the collection of the Acad. Nat. Sci. Phila.

TABLE OF GENERA.

1. Robust, short species; abdomen flat, wide ..... 2.
   Slender, elongate species; abdomen cylindrical ..... **Pseudatrichia.**
2. First posterior cell open in margin ..... **Scenopinus** Latr.
   First posterior cell closed and petiolate; body clothed with scale-like hairs. **Metatrichia** Coq.

SCENOPINUS Latr.

The species of this genus are robust, and generally black. Head more or less hemispherical, higher than long; front descending: scutellum distinctly separated from the thorax by a wide suture, its apex not depressed; abdomen flat, broad; each segment with a transverse furrow and their posterior margins turned up; the second segment has two minute approximated opaque spots on its dorsum. Legs short and stout. Wings rather broad but longer than the thorax; first posterior cell open in the margin.

On account of its robust appearance and the general shape of the head and abdomen, it seems to form, with the genus *Metatrichia*, a separate group, wherein *Metatrichia* differs in its closed first posterior cell.

In some species the sexes vary considerably in size, the male being the smaller; even the same sex will vary, thus making this character very unreliable. In species where the female shows some white on the posterior margins of the abdominal segments, the male is very likely to have several segments entirely white.

TABLE OF SPECIES.

1. Third and fourth veins at their apices parallel to each other; last section of third vein about three-fifths as long as the preceding section; front rough; femora black.....**nubilipes** Say, ♂, ♀.

   These veins converge as they approach the costa; last section of third vein not shorter than the preceding section ....2.

2. Front polished, not pitted, except sometimes near the antennæ.
   glabrifrons Meig., ♂, ♀.

   Front rough, pitted, polished only in a narrow median furrow and narrowly along the orbits.....**fenestralis** Linn., ♂, ♀.

The species *albidipennis* Loew I have not seen, but I give the reference and a translation of the typical description further on.

Scenopinus fenestralis Linn., Pl. II, fig. 1.

This is the typical species of the family, and is commonly known as the "window-fly;" the larvæ are often found under carpets and are supposed to feed upon the larvæ of the carpet moth.

Generally black. Front minutely rugose, giving it a sub-opaque appearance, but is narrowly polished along the orbits and in a narrow median furrow. Thorax marked with minute furrows; pleuræ more shining. Scutellum also furrowed. Abdomen shining, posterior margins of second to fifth segments of male generally narrowly whitened. Knobs of halteres white, brown above. Legs generally yellow, but the femora and tibiæ, especially the hind pair, dark to nearly black, knees yellow, apices of all tarsi infuscated. The third and fourth veins of the wing are not parallel before they enter the costa, but converge their entire length from the cross-veins; last section of third vein longer than the preceding section. Length ranging from 4-6 mm.

With older and dried out specimens the color becomes more distinct, ranging from black through brown to nearly rufous.

Scenopinus glabrifrons Meig.

In general similar to *fenestralis*, but the front is entirely polished, excepting sometimes a little rough just above the antennæ; the

thorax is also more polished although faintly furrowed; the knobs of halteres entirely white. Size about the same.

Scenopinus nubilipes Say, Pl. II, fig. 2.

This is a somewhat smaller species. The male has never before been described, and is so different from the female, that one is very liable to take it for a new species. I have seen a pair in the U. S. Nat. Mus. collection which were taken in copula.

Much smaller than *S. fenestralis*, which it resembes, and the third and fourth veins become distinctly parallel a short distance before they enter the costa; the femora, except the knees, black; the last section of the third vein about three fifths as long as the preceding section.

Before me are two males and one female from Alamogordo, New Mexico (Rehn and Viereck). Of the males I give the following description:

Head entirely black. Eyes very large, contiguous from the prominent ocellar-tubercle to near the antennæ, leaving a frontal triangle about as long as the second antennal joint; the line of separation of the facets about on level with the antennæ. Front pollinose, with a narrow median furrow. Face and cheeks very narrow. Occiput flat or slightly convexed. Antennæ black, pollinose, situated below the center line of the eyes; third joint three times as long as the second. Palpi and proboscis black.

Thorax black, semi-opaque, clothed with minute scattered white hairs; a minute brown spot behind each humeral callus; the post-alar calluses brownish. Pleura brownish. Scutellum black, semi-opaque. Halteres brown, with white knobs. Squamulæ white.

Abdomen blackish-brown, shining, clothed with scattered whitish hairs; two elongated velvety-black spots on the dorsum of the second segment; dorsum of third to fifth segments totally white, or sometimes the posterior margins only whitened.

Legs blackish-brown, but the knees of all femora, the bases, especially of the hind tarsi, yellowish. Wings hyaline; veins yellowish, darker towards their bases; the last section of the third vein three-fifths as long as the preceding section. Length ranging from 2.5–4 mm.

Scenopinus albidipennis Lw., Cent., VIII, 53. 1869.

"*Male.*—Black; head and thorax subopaque; abdomen shining, the posterior margins of the intermediate segments white; antennæ black; legs black, excepting the entire anterior and apices of posterior tibiæ and all tarsi brownish; halteres white, pedicel black; wings whitish-hyaline, with the first three veins yellow, the remaining veins brownish, not clouded. Length 1.5 lin."

Hab.—Cuba.

METATRICHIA Coq.

In general form similar to *Scenopinus*, robust, mostly black ; but the thorax is more arched above ; *the scutellum is not separated from the thorax by a distinct wide suture*, and its apex depressed, forming an unbroken curve with the thorax when seen in profile ; *entirely clothed, excepting the dorsum of abdomen, with scale-like hairs*, which on closer observation are elongated bulbs inserted on short stalks, giving the insect a whitish appearance. The *first posterior cell closed and petiolate.*

Metatrichia bulbosus O. S., Pl. II, figs. 3 and 4.
Scenopinus O. S., West. Dipt., 275, 1877.

This species is very well described by Osten Sacken. Three males and two females from Alamogordo, New Mexico (Viereck and Rehn), differ from the typical description in that the head and thorax do not seem to have that blackish-bronze color ; the scales are all clear white ; the costal cell is not brown ; and the distance between the two cross-veins is not shorter than the posterior cross-vein.

PSEUDATRICHIA O. S.

The species of this genus, as far as I have seen, are of an entirely different shape from those of the other two genera, and seems to form a distinct group in themselves by their slender, elongated bodies and legs.

The following characters are typical for our present species, and as to our present knowledge of the genus : slender, elongate species ; thorax longer than broad, slightly arched above ; scutellum rather prominent, but not large ; abdomen narrow, cylindrical, not flat ; legs slender, elongated ; wings narrow in proportion to their length, first posterior cell closed and petiolate.

TABLE OF SPECIES.

1. Scutellum yellow, or brownish in middle ....2.
   Scutellum entirely black .....3.
2. Abdomen and head black .....**longurio** Lw., ♂.
   Abdomen and head yellowish, in fact, the entire insect generally brown or yellowish ....**griseola** Coq., ♂, ♀.
3. Abdominal dorsum shining, more or less pilose ....4.
   Abdominal dorsum, at least in part, semi-opaque ; the segments more or less dilated at their posterior margins ; head as long or longer than high.
   unicolor Coq., ♂, ♀.

4. Front and face black; thorax and femora rather long, pilose.

pilosa Coq., ♂.

Front and face yellow; thorax and femora not long, pilose; the anterior margin of the thorax, especially the male, yellow, in form of two large spots separated by a narrow median black line.

flaviceps Coq., ♂, ♀.

Pseudatrichia unicolor Coq., Pl. II, figs. 6, 7.

Of all the species of this genus, except the type *Atrichia longurio* Lw. (which I have not seen), *unicolor* is so different from the others that I doubt if it should be included with them under the same genus. Not knowing the generic type, and as the typical description does not give sufficient structural characters, I cannot say which of the two forms are typical, and therefore make no attempt to erect a new genus, leaving that to the monographer, or to some one who is fortunate enough to see Loew's type.

The difference referred to is as follows: head longer than high or nearly spherical; eyes in the same proportion; front horizontal, descending only near the antennæ; the thorax posesses a wart like process, in a depression just above each fore coxæ, which is, in this species, clothed with rather long fine hairs; the abdominal segments dilated at their posterior margins, appear to overlap. The form of the head and abdomen especially are very noticeable.

The female of this species has never been described, but is very similar to the male, except that the front is parallel and minutely rugose, not polished, except along the orbits. Both sexes have upon the dorsum of the second abdominal segment two minute velvety black spots surrounded by a polished area. These spots, I notice, are present in nearly every species of this family.

One of both sexes from Alamogordo, New Mexico (Viereck and Rehn). One female from Cloudcroft, New Mexico (Viereck and Rehn), Pl. II, fig. 8 and 9, differs somewhat from the typical species in that the head is longer; the eyes likewise elongated; antennæ black; abdomen proportionately longer, with its dorsum entirely granular, opaque; the two spots on the second segment wanting; the third section of the third vein longer than the last section.

Pseudatrichia griseola Coq., Pl. II, fig. 5.

Two females, Alamogordo, New Mexico (Viereck and Rehn).

A well marked species, distinguished by its general yellowish or brown color.

Pseudatrichia pilosa Coq.

The hairs of the thorax and femora are unusually long, a very marked character, especially with fresh, well preserved specimens.

Pseudatrichia flaviceps Coq.

A well marked species, easily distinguished by the two large yellow spots on the anterior margin of the thorax, and the entire yellow front and face. The whitish line below each wing is very narrow, sometimes hardly visible.

In looking over this species in the National Museum I discovered a male, and as this sex has not been described, Dr. Coquillett kindly gave me permission to do so.

Front very narrow, as wide as the second antennal joint at its narrowest part; antennæ yellow, but the third joint brownish; the yellow of the thorax less extended, limited to lateral humeral angles; the postalar calluses entirely yellow (those of the female brownish); the knobs of halteres entirely white. This specimen the color in general is more brownish, and the markings more whitish; the legs accordingly, so that the yellow of the knees is not so marked. Length 3 mm.

One specimen from Williams, Arizona (Barber). Collection of U. S. N. M.

Pseudatrichia longurio Lw.

Atrichia Loew, Cent., vii, 76, 1866.

"*Male.*—Black, opaque; third antennal joint dark rufous, the anterior edge darker; humeri and scutellum yellowish or brownish; feet and coxæ brownish; but the extreme bases of coxæ and apex of tibiæ and tarsi darker brown; abdomen slender, elongated; hypopygium dark rufous; wings grayish-hyaline, veins brownish. Length 4 lin."

Hab.—Mexico.

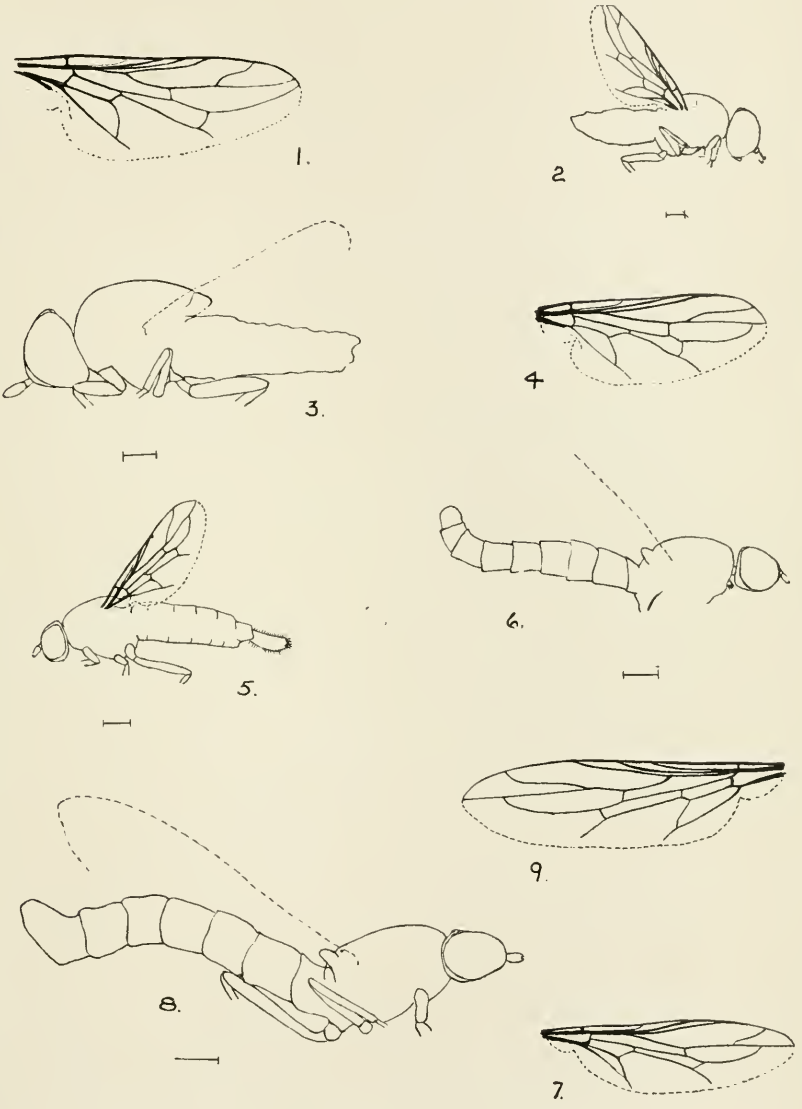
EXPLANATION OF PLATE II.

Fig. 1. *Scenopinus fenestralis*, wing.
" 2. " *nubilipes*, ♂.
" 3. *Metatrichia bulbosus*, ♂.
" 4. " " wing.
" 5. *Pseudatrichia griseola*, ♀.
" 6. " *unicolor*, ♂.
" 7. " " wing.
" 8. " " (variety), ♀.
" 9. " " wing.

CORRECTION TO PAPER I.—ORTALIDÆ.

The table on page 285 (Trans., Vol. 32), at 2a, should read:

2a. Antennæ at least six times as long as the width of the second joint; third joint elongated, unusually long ..... **Stictomyia** Big.
Antennæ not so long; third joint more or less oval.....3 of manual.



CRESSON ON DIPTERA.

VOLUME XXXIII, NUMBER 2 & 3.

TRANSACTIONS

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PHILADELPHIA.

SUBSCRIPTION PRICE FOUR DOLLARS PER VOLUME.

Smithsonian Institution
DEC 25 1900

abdominalis

duplo

metallico

nanula

acantha

atrata

arizonensis

azteca

mexicana

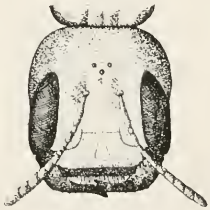
diodonta

bakeri

coboltina

lunata

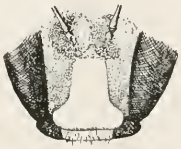
auriviridis ♀



gigantea ♀

arizonensis ♂

lunata ♂



atrata ♂

SMITH ON HYMENOPTERA.

CONTRIBUTIONS TOWARD A MONOGRAPH OF THE CERATINIDÆ OF NORTH AND MIDDLE AMERICA.

(Plate III)

BY HARRY SCOTT SMITH, LINCOLN, NEBRASKA.

It was the ambition of the writer, when this study was first undertaken about a year ago, to present at an early date a complete monograph of the family Ceratinidæ as represented in North and Middle America. Consequently numerous letters were written to different Hymenopterists and collectors throughout the country, with the object in view of getting together a large amount of material which would correctly represent the fauna of the territory which was to be included by such a study. For the region north of Mexico, in which the number of species is comparatively small, the results were fairly satisfactory, but for the remainder of the territory, Mexico and Central America, where the fauna is exceedingly rich and varied, it seems next to impossible to get material at the present time, owing to the scarcity of collectors in those localities. It is hoped that this paper, preliminary as it must necessarily be, will be effective in attracting the attention of collectors and others to these most interesting and beautiful little bees, and that within the not far distant future it will be possible to expand it into a complete and representative monograph of the family.

In all twenty-nine species are considered, of which nine are described as new, this number including all species known to have been recorded from the above region up to the present time. A large per cent. of the species from Mexico and Central America are known in one sex only, and this condition will of course exist until numerous specimens are brought to light from those localities. The greatest difficulty in the study of the genus is in the extreme similarity of the females of certain species, of which the males are very easily separated. In most cases, however, a close study of the punctuation and of the infuscation of the wings, together with the general habitus, will serve to separate them, although the differences are often hard to express in a table. Concerning the characters to

be used, the presence or absence of lateral face marks seems to be constant, and is used as one of the first divisions in the table to the females. The coloration of the tubercles, however, is not so reliable, although as a general rule it is a good character. I have a specimen of *dupla* with dark tubercles, also one of *pacifica*, yet these species are placed under the division having them light or cream colored. In the case of the males the shape of the apical plate is very constant, though often difficult to describe in words, but this is provided for by the sketches.

It is my pleasure to express thanks to Mr. Myron H. Swenk for his valuable criticisms and for looking over the manuscript, to Prof. L. Bruner, Mr. Henry L. Viereck, Prof. T. D. A. Cockerell, Mr. C. F. Baker and Abbe V. A. Huard for invaluable assistance rendered, and to many others who have by furnishing specimens or by other means aided me.

CERATINA Latreille.

Synon: *Zudontomerus* Ashmead, Trans. A. Ent. Soc., xxvi, p. 69.

Mr. Viereck has examined the mouth parts of a specimen of the type series of *C. tejonensis* Cresson, the type of the genus *Zudontomerus*, and finds the the maxillary palpi six-jointed, as in the other species. The triangular tooth on the hind femora is present in a majority of the species of *Ceratina*, and the shape of the apical plate is hardly generic in character.

SYNOPSIS OF MALES.

1. Black bees, with white marking and whitish pubescence; very small species; 3–3.5 mm.....2.
   Metallic-blue or green bees; both large and small species .....3.
2. Apical plate concave, the concavity shallow; clypeus entirely white; the entire face below the antennæ white (Southwestern United States).
   arizonensis Cockerell.
   Apical plate crescent shaped, the corners acute; clypeus and two good-sized lateral face marks white (Texas) .....**lunata** n. sp.
   Apical plate rounded, and with an acute triangular tooth medially; clypeus and two small lateral face marks white (Belize, British Honduras).
   atrata n. sp.
3. Apical plate with two very small teeth medially; small species.....4.
   Apical plate rounded, truncate, pointed, or obtusely bilobed.....5.
4. Face very narrow; mandibles with only a small white spot; teeth of apical plate blunt and indistinct; 3 mm.....**bakeri** n. sp.
   Face broader; anterior margin of mandibles with a heavy white border; teeth of apical plate pointed and well defined; 3.5 mm...**diodonta** n. sp.

5. Apical plate obtusely bilobed; lateral face marks present; mandibles yellowish-white basally.....6.
Apical plate of various shapes, but not obtusely bilobed.....7.
6. Interval between lobes with a small acute spine; legs dull red, shining.
rufipes F. Smith.
Interval between lobes without a spine; legs not dull red; color a brilliant blue-green; 8 mm. (Cuba).....**cobaltina** Cresson.
7. Apical plate broad basally, but abruptly narrowed and then prolonged gradually into a narrow subacute projection medially.....8.
Apical plate not gradually prolonged into a narrow subacute projection; sometimes there is a small median projection, but the corners of the plate are then sharp, or else the posterior margin forms a double sinus..10.
8. Tubercles dark; median projection of apical plate relatively narrow; central arm of clypeal mark much shorter than the lateral ones; hind femora produced beneath to an angle less than a right angle; 4.5–6 mm. (*submaritima* Cockerell).....**acantha** Provancher.
Tubercles light; median projection of apical plate relatively somewhat broader.....9.
9. Occiput closely punctured; color bluish-green; hind femora produced into an angle greater than a right angle; 4.5 mm. (Southwestern States).
nanula Cockerell.
Occiput more sparsely punctured; color brassy-green; arms of clypeal mark about equal; anterior tibiæ with a white line extending the entire length; 5–6 mm. (Pennsylvania).....**metallica** n. sp.
10. Apical plate broad at apex, rounded or subtruncate, never pointed; mandibles dark at base.....11.
Apical plate variously shaped, but not rounded or subtruncate at the apex as above; base of mandibles with a light spot.....15.
11. Tubercles dark.....12.
Tubercles white or cream colored.....13.
12. Abdomen of a coppery hue; head and thorax blnish-green; small lateral face marks present; wings dark smoky; 7 mm. (Central America).
abdominalis n. sp.
Abdomen bluish-green; lateral face marks absent; wings subhyaline; 9 mm. (California).....**tejonensis** Cresson.
13. Anterior tibiæ reddish in front, with a very well-defined light stripe on the outer side; 5 mm. (Texas).....**strenua** F. Smith.
Anterior tibiæ blue-green in front, light stripe on outer side poorly defined, or absent.....14.
14. Face and disk of dorsal abdominal segments closely punctured; color dark bluish-green (United States).....**dupla** Say.
Face and middle of dorsal abdominal segments more sparsely punctured; cheeks sparsely punctured; color light, more yellowish-green (Western United States).....**ncomexicana** Cockerell.
15. Wing nervures pale brown; mesothorax finely punctured; spots on face confluent with the clypeal marks; 9–10 mm. (Mexico).
mexicana Cresson.
Wing nervures black; mesothorax more coarsely punctured; spots on face not confluent with the clypeal marks; 10 mm. (Mex.)..**azteca** Cresson.

SYNOPSIS OF FEMALES.

1. Black bees with white markings and whitish pubescence; very small species; 3–4 mm.....2.
   Greenish or blue bees, both large and small species.....3.
2. Scutellum sparsely punctured (Belize, British Honduras)....**atrata** n. sp.
   Scutellum more closely punctured (Southwestern United States).
   lunata n. sp.
3. Lateral face marks present.....4.
   Lateral face marks absent.....9.
4. Abdomen bright crimson or carmine; head and thorax brilliant green.....5.
   Abdomen bluish or greenish.....6.
5. Legs pale ferruginous; wings subhyaline; size smaller, 8–9 mm. (Panama).
   eximia F. Smith.
   Legs green; wings smoky; size larger, 10.5–11.5 mm. (Mexico).
   amabilis Cockerell.
6. Color extremely brilliant golden-green; face with a few broad, deep punctures; clypeus with a slender inverted T-shaped mark, not usually found in females; anterior tibiæ with white stripe extending entire length; 4.5–6 mm. (Belize, British Honduraz)...**auriviridis** n. sp.
   Color not as above; clypeal marks of usual form.....7.
7. Color olive-green; lateral face marks elongated, reaching level of antennæ (Panama).....**punctulata** Spinola.
   Dark bronze-green.....8.
8. Size large, 10–11 mm. (Mexico).....**mexicana** Cresson.
   Size smaller, 7–8 mm. (Panama).....**placida** F. Smith.
9. Tubercles white or cream colored.....10.
   Tubercles concolorous with rest of thorax.....16.
10. Wings hyaline or smoky, nervures darker; head very large; abdomen olive-green; 9–10 mm. (Mexico).....**capitosa** F. Smith.
    Wings hyaline or smoky, nervures darker; head not unusually large....11.
11. Wings clear hyaline, strongly iridescent; small species, 3.5–5.5 mm. (Texas).13.
    Wings more or less smoky; both large and small species.....12.
12. Size large, 10 mm.; face and mesothorax anteriorly very sparsely punctured; wings very dark, especially on anterior margin; pleura with a large impunctate area above (Southern California).....**pacifica** n. sp.
    Size smaller, 8 mm. or less; pleura with no impunctate area, or with a very small one.....14.
13. Smaller, color more brass-green; wings very strongly iridescent; punctures of face broad.....**diodonta** n. sp.
    Usually larger, color more bluish-green; iridescence of wings not so strong; punctures of face smaller.....**nanula** Cockerell.
14. Mesothorax in front sparsely punctured; wings strongly suffused with brown; abdomen sparsely punctured medially; 7–9 mm. (New Mexico).
    neomexicana Cockerell.
    Mesothorax in front closely punctured; wings not so dark as above; abdomen more closely punctured medially.....15.
15. Face closely punctured; bluish-green; wings only faintly smoky; cheeks more closely punctured; size larger, 7–8 mm. (U. S.)....**dupla** Say.

Face with large, widely separated punctures; olive-green; wings slightly dusky toward apex; cheeks almost impunctate; size smaller, 4–6 mm. (Mexico, Central America) ..... **nautlana** Cockerell.

16. Wings yellowish, nervures almost colorless; head very large; abdomen olive-green; 9–10 mm. (Mexico) ..... **capitosa** F. Smith.

Wings either hyaline or smoky, nervures darker ..... 17.

17. Size very large, 11–13 mm ..... 18.

Size smaller, 6–9 mm ..... 19.

18. Color brilliant peacock-green; head strongly punctured; dorsal abdominal segments margined with black; length 11 mm. (Panama). **læta** Spinola.

Color dark blue; head finely and very sparsely punctured; head one and one-half times as wide as thorax; wings dark smoky; length 13 mm. (Southern California) ..... **gigantea** n. sp.

19. Color bright metallic-green; wings infuscated; head and mesothorax closely punctured; abdomen bluish-green, tip incurved; 6 mm. (Cuba). **cyaniventris** Cresson.

Color bluish or bronze-green, not bright metallic as above ..... 20.

20. Head and thorax dark steel-blue or bluish-green ..... 21.

Head and thorax greenish, somewhat lighter ..... 22.

21. Abdomen coppery; wings strongly infuscated; cheeks sparsely punctured; 8 mm. (Central America) ..... **abdominalis** n. sp.

Abdomen tinged with olive-green, sometimes golden at apex; 7–9 mm. (Mexico) ..... **ignara** Cresson.

22. Face, abdomen and pleura more closely punctured; wings darker; 8 mm. (Mexico) ..... **townsendi** Cockerell.

Face, abdomen and pleura more sparsely punctured; wings not so dark; 5–6 mm. (Western U. S.) ..... (*submaritima* Ckll.), **acantha** Prov.

Ceratina lunata n. sp.

♂. Length 3 mm.—Shining black, with ivory-white markings. Face smooth and impunctate, or with only an occasional roughening of surface. Clypeus entirely ivory-white. Labrum with a large quadrate whitish mark medially and a dark spot laterally. Mandibles dark, rufous medially. Lateral face marks present, same color as clypeus and extending upward half way to its upper margin. Antennæ brown, inserted in broad, deep depressions, the two separated by a strong median ridge which has a single row of punctures on each side. Vertex smooth, occiput with a few punctures, cheeks entirely impunctate. Mesothorax punctured around the edges, impunctate on the disk. Scutellum and postscutellum very finely punctured, metathorax extremely so, the upper surface with a median depression. Pleura finely punctured, tubercles entirely white. Abdomen strongly narrowed basally. First segment impunctate, usually somewhat testaceous, remaining segments finely rugose-punctate, fringed with light hairs. Venter finely punctured, somewhat testaceous. Apical plate crescent shaped. Legs testaceous, anterior femora with a white stripe extending two-thirds of the length, tibiæ with stripe running entire length, tarsi yellowish. Posterior tibiæ with stripe running about half the length. Middle femora with an obtuse tooth such as is found on the hind femora of other species. Wings hyaline, strongly iridescent, basal part yellowish.

♀. Differs from the male as follows: size somewhat larger; clypeus with only a rectangular ivory-white mark; labrum and sides of face entirely dark; thorax more closely punctured; abdomen pointed at apex.

Described from 6 males and 2 females taken at Fedor, Lee Co., Texas, March and April, 1902, by Rev. G. Birkmann.

This species and the following one are the second and third black species described from North America, the only other described species being *C. arizonensis* Cockerell. The name *lunata* refers to the crescent-shaped apical plate of the male.

Ceratina atrata n. sp.

♂. Length 3.5 mm.—Body shining black. Face impunctate, clypeus with the usual ivory-white T-shaped mark, the central arm about twice the length of the lateral ones, that portion of the face above them with a minute white dot. Labrum brownish with a median white patch, mandibles black, rufous toward the tips. Cheeks almost entirely impunctate, occiput with a very few irregular punctures. Antennæ brownish-black. Mesothorax with a narrow border of punctures, but smooth on disk excepting the longitudinally impressed lines. Scutellum and postscutellum finely punctured, metathorax still more finely so. First abdominal segment impunctate, remaining segments with fine punctures, the apical plate broad, with corners rounded and with a sharp point at the apex, like the lower edge of a shield, and finely punctured dorsally. Venter having segments fringed with silvery hairs. Legs black, tarsi ferruginous, anterior tibiæ with a broad white stripe in front. Tubercles white. Wings subhyaline, strongly iridescent, nervures and stigma dark brown.

♀. Differs from the ♂ in having only a broad rectangular stripe on the clypeus, no white on the labrum, and in the sparsely punctured scutellum.

Described from a pair from Belize, British Honduras, sent to me by Mr. C. F. Baker.

Ceratina bakeri n. sp.

♂. Length 3 mm.—Dark bluish-green. Face comparatively very narrow, coarsely punctured, the punctures very sparse directly above the clypeus. T-shaped clypeal mark with central arm much longer and wider than lateral ones. Labrum whitish, with a black spot on each side. Mandibles lighter at tip. Cheeks sparsely but deeply punctured, occiput densely so. Mesothorax quite densely punctured, with three indistinctly impressed longitudinal lines. Scutellum and postscutellum finely and closely punctured. Superior face of metathorax longitudinally striate, posterior face punctate. First segment of abdomen almost entirely smooth, second and third finely punctured, remaining segments rugose, fringed with quite long whitish hairs. Apical plate shaped similarly to that of *C. diodonta*, the two teeth not so distinct, however. Legs green, tarsi ferruginous. Anterior tibiæ with a pale stripe running two-thirds of the way to base of tarsus, knees white. Tubercles white, wings hyaline, strongly iridescent.

Related to *C. diodonta*, but easily separated by the much narrower face and difference in sculpture.

Described from a unique male collected at Acapulco, Mexico.

Dedicated to Mr. C. F. Baker, from whom it was received, and who collected the type.

Ceratina acantha Provancher, Nat. Can., Vol. xxii (Dec., 1895), p. 190, ♀.
Synon. *C. submaritima* Cockerell, Proc. Acad. Nat. Sci. Phil. (Sept., 1897), p. 352, ♂, ♀.

Through the kindness of Abbe V. A. Huard, curator of the Provancher collection, I have examined the type of *C. acantha*, and find it identical with *C. submaritima* Cockerell, ♀, hence the former name holds by virtue of priority.

Ceratina diodonta n. sp.

♂. Length 3.5-5 mm.—Body shining, in general appearance somewhat like *C. nanula* Ckll., but smaller and of a more brassy color. Mesothorax sometimes with a tinge of purplish on the disk. Antennæ dark brown. Face much more coarsely punctured than in *bakeri*, clypeus with a large creamy-white inverted T-shaped mark, the three arms approximately equal, anterior margin darker. Lower side of face with a white dot or triangular mark on each side of clypeus. Labrum entirely white, but for a black dot on each side. Mandibles black, anteriorly with a heavy white border. Occiput more finely punctured than face, cheeks almost impunctate. Mesothorax finely punctured in front, with the usual impressed lines, almost impunctate on the disk. Scutellum finely punctured, postscutellum extremely so. Superior face of metathorax finely rugose, posterior face with fine punctures, smooth beneath, lateral faces similar. Pleura coarsely punctured like the face. First abdominal segment almost impunctate, next two finely punctured, sparsely so on the disk, remaining segments rugose, fringed with a few light hairs. Apical segment broad, but with two small teeth medially. Femora and tibiæ green, with whitish pubescence, tarsi testaceous. Tubercles white. Wings hyaline, strongly iridescent.

♀. Differs from the male by the more sparsely punctured face and occiput, the clypeal marking is merely an oblong mark, and the mesothorax is more sparsely punctured.

Described from numerous specimens from Fedor, Lee County, Texas, February 24th to April 27th, Rev. G. Birkmann, collector. The female of this species is difficult to separate from the female *nanula*, but differs in the more brassy color, smaller size and more iridescent wings.

Ceratina metallica n. sp.

♂. Length 5-6 mm.—Body entirely brassy-green, shining. Clypeus almost entirely white, the three arms of the clypeal marks about equal. Face coarsely and quite densely punctured, clypeus with numerous irregular indentations. Labrum with a quadrate white spot, mandibles black. Cheeks with distinct, well separated punctures, occiput with punctures close together. Mesothorax closely punctured, excepting on the disk, and with five longitudinally impressed

lines. Scutellum and postscutellum somewhat more finely punctured. First segment of abdomen with a few punctures in the middle, otherwise perfectly smooth, two and three finely and closely punctured, remaining segments rugose, six with a prominent brush of light hairs. Apical plate very narrow, as in *acantha* and *nanula*. Legs green, tarsi fulvous at tip. Knees with a white dot, anterior tibiæ with a white line extending entire length. Tubercles white. Wings hyaline, strongly iridescent.

Described from two males from Sunbury, Pennsylvania, sent to me by Mr. C. F. Baker.

Ceratina abdominalis n. sp.

♂. Length 7 mm.—Body shining, head and thorax dark bluish-green, sometimes æneous. Abdomen a brilliant coppery hue. Face with coarse, rather sparse punctures, quite irregular, clypeus impunctate. Antennæ black. Clypeus excepting the narrow reflexed anterior margin, a triangular space on the face on each side of the clypeus, and a quadrate spot in the middle of the labrum, yellow. Mandibles wholly black, or with the tips reddish. Labrum coarsely and sparsely punctured, clothed with a few pale hairs. Cheeks and occiput quite closely punctured, excepting a narrow impunctate area just behind the eyes. Posterior margin of the occiput strongly reflexed. Thorax finely punctured, disk impunctate and blackish in color, with five short, impressed longitudinal lines. Scutellum finely punctured, postscutellum more closely so, sometimes brassy-green in color. Dorsal portion of metathorax irregularly longitudinally striated, the truncation extremely minutely punctured, posterior face closely punctured above, more sparsely so below. Pleura with good sized punctures, about as far apart as their diameters, and clothed with sparse white pubescence. Tubercles concolorous with rest of thorax. Abdomen bright coppery, first segment impunctate, except on the disk, second and third segments finely punctured, remaining ones somewhat rugose. Venter brassy-green, closely punctured, each segment with a fringe of white hairs, tip of abdomen also with long pubescence, penultimate dorsal segment with a short median brush. Apical plate truncate, almost twice as broad as long, corners well rounded. Legs green, pubescent, tarsi ferruginous, with light fulvous pubescence on inner side. Wings dark smoky, strongly iridescent, tegulæ piceous.

♀. Differs from the ♂ as follows: length 8 mm., head proportionately somewhat wider than in ♂; clypeal marking consists of an obconic yellow spot, no lateral face marks, or marks on labrum; clypeus with a few coarse punctures. Apex of abdomen pointed.

Type.—♂ and ♀, Monte Redunda, Costa Rica, March, 1902. Thirty-two paratypes from above locality and Juan Vinas (L. Bruner), and one from San Marcos, Nicaragua (C. F. Baker).

Ceratina auriviridis n. sp.

♀. Length 4.5–6 mm.—Brilliant peacock-green throughout, with bright golden reflections. Face with a very few broad, deep punctures, irregular in shape and size. Clypeus medially and spaces above lateral portions of clypeus impunctate, also a large space lateral to and above the antennæ extending to a line passing behind the lateral ocelli; a row of punctures form a V in front of

the ocelli. Cheeks almost entirely smooth, occiput coarsely punctured. Clypeus with an inverted T-shaped white mark, the arms very slender as compared with those of other species. A dot above the lateral portions of the clypeus, and a slender mark along the inner orbit of the eye about the height of the antennæ, also base of mandibles white, remaining portion rufous. Labrum entirely dark, sometimes ferruginous. Thorax closely punctured, smooth on the disk and with five distinct grooves, the lateral ones much shortened anteriorly. Scutellum with sparse, medium sized punctures, postscutellum finely and closely punctured. Metathorax with punctures of various sizes, those on the truncation being much the finer. The upper surface bears a short median carina. First segment of abdomen almost impunctate, next two finely and closely punctured, remaining segments rugose, last segment pointed and with a fringe of light hairs, each segment having a narrow black margin. Venter thinly pubescent. Legs green, tarsi and extreme portions of tibiæ ferruginous. Anterior tibiæ with a whitish stripe in front extending the entire length, femora with a white spot on the outer side. Pleura with thin white pubescence. Wings hyaline, faintly clouded at the tips, iridescent. Tegulæ light brown, tubercles green.

Described from two ♀ specimens from Belize, British Honduras, received from Mr. C. F. Baker.

This is a very pretty species, easily recognized by the golden-green color, puncturation and clypeal markings.

Ceratina pacifica n. sp.

♀. Length 10 mm.—Dark bluish-green, shining. Clypeus with an oblong yellowish spot, with a very few coarse punctures, smooth on the disk. Mandibles and labrum black. Face very sparsely punctured, antennæ black, rufous beneath. Cheeks finely and very sparsely punctured, occiput much more closely so. Mesothorax also finely and sparsely punctured, impunctate on the disk, and with five longitudinal grooves. Pleura with a large impunctate area above. Scutellum sparsely punctured, postscutellum more densely so. Upper surface of metathorax roughened anteriorly, exceedingly minutely punctured on the truncation, posterior surface and metapleura finely punctured, the former with a deep longitudinal sulcus. First abdominal segment almost impunctate, two and three finely punctured, remaining segments rugose. Legs blue-green, with yellowish white pubescence, knees with a white dot, tips of tarsi ferruginous. Tubercles white. Wings smoky hyaline, nervures black.

Type locality, Wilson Peak, Los Angeles County, California, altitude 6000 ft.; also from Tehachapi Mts., altitude 4000 ft., Dr. A. Davidson collector; one specimen from Claremont, California, C. F. Baker collector.

This species presents a dimorphism, in the shape of cheek spines, similar to that found in some species of the genus *Perdita*.

Ceratina gigantea n. sp.

♀. Length 13 mm.—Color blue-green. Head quadrate, width one and one-half times that of the thorax. Eyes comparatively very small. Clypeus very

short and broad, with a triangular whitish mark, sparsely punctured. Labrum large and black in color. Mandibles very heavy and strongly elbowed. Face sparsely punctured, cheeks and occiput almost impunctate. Mesothorax very sparsely punctured, smooth and purplish on the disk, and with the usual impressed lines. Scutellum and postscutellum finely and rather closely punctured. Anterior half of upper surface of metathorax rugose, remaining part extremely minutely punctured, strongly contrasting with the coarser punctures of the posterior face. Abdomen large and broad, finely punctured, posterior segments rugose. Venter clothed with fine grayish-white pubescence. Legs greenish-blue, clothed with light pubescence, knees having a white spot, tips of tarsi ferruginous. Tubercles concolorous with thorax. Wings smoky hyaline.

Described from one ♀ specimen, collected by Dr. A. Davidson in Tehachapi Mountains, California, altitude 4000 ft.

This species is rendered very distinct by its great size, and its large and peculiarly punctured head.

NEW SPECIES OF NOCTUIDÆ FOR 1907.

No. 1.

BY JOHN B. SMITH, SC. D.

Acronycta elisabeta n. sp.

Ground color a very uniform ash-gray, without conspicuous powderings. Front of head with a smoky tinge and the thoracic disc with a faint luteous shading. Primaries with all the maculation very neatly written, not diffuse. The black basal streak is very well defined, sharply marked to the t. a. line, the inner part of which it joins. Basal line geminate, obscurely marked and lost before the basal streak. T. a. line geminate, outwardly oblique from costa, the outer portion lost below costal inception, the inner black, broken, clearly defined at and each side of its junction with the basal streak, less evident beyond that to the inner margin, interrupted by an inward tooth on the submedian vein. T. p. line narrow, black, lunulate, preceded by a narrow white line, widely outcurved over the cell and well drawn in below, crossed in the submedian interspace by a very distinct sharply defined black streak. A diffusely lunulate, interrupted whitish s. t. line. A dusky terminal line with larger interspaceal dots, beyond which is a dusky interline in the fringes. An obscure luteo-olivaceous median shade extends obliquely from the middle of the costa to the lower part of the reniform and is then lost. Orbicular oval, incomplete, concolorous; reniform kidney-shaped, inner side very convex, moderate in size, somewhat darkened inferiorly. Secondaries of male uniformly smoky fuscous. Beneath: primaries blackish, paler toward base, with an angulated exterior line. Secondaries whitish, powdery, more so along costa, with an irregular extra-median blackish line and a large ovate discal spot.

Expands 1.32 inches = 33 mm.

Hab.—North Elizabeth, New Jersey, in August.

One good male from Mr. H. H. Brehme taken on a maple tree. The species suggests *radcliffei* at first sight; but is not as bright a gray and not nearly so well marked. It has rather a more uniformly dull gray than any other of our species, and the dusky secondaries of the male are characteristic and unlike any other of our forms.

Specimens are also in the collections of Messrs. Buchholz of Elizabeth, and Keller of Newark.

Semiophora grisatra n. sp.

Head and thorax bluish-gray, palpi dark brown except at tip. Primaries blue-gray over a smoky base. Basal line distinct, single, black, broadest on costa, narrowing to the submedian vein, where it ends. T. a. line marked by an oblique black costal streak which touches the middle of the orbicular, by a blackish spot in cell before the orbicular, and by a vague line of black scales following a slightly paler shade from median vein to inner margin. T. p. line marked by a

triangular black spot on costa over reniform, then by a very even paler gray line which runs parallel to outer margin. S. t. line irregular, marked by a preceding smoky shading which is sharply defined against the paler terminal space. Claviform indicated by blackish scales. The cell around the ordinary spots is somewhat smoky, and as the spots themselves are somewhat paler than the ground, they stand out sharply without other defining lines. Orbicular oval, oblique, of good size. Reniform moderate in size, oblique, broadly kidney shaped. Secondaries blackish, with pale somewhat rosy fringes. Beneath: primaries blackish, with a lilac-gray washing and a darker extra-median line; secondaries more gray, more powdery, the lilac tinting more obvious, with a narrow extra-median line and small discal spot. The entire body beneath is of the same lilac-gray tinge.

Expands 1.55 inches = 39 mm.

Hab.—Lakehurst, N. J., September 27th.

One female in good condition. This has the wing form of *elimata*, but is much more evenly gray than any example of that species that I have ever seen, and has almost black secondaries, which never occur in the older species. There are other differences in details of maculation, such as the absence of basal black streak, which may be better pointed out when additional material is at had. The specimen was taken at sugar by Mr. J. A. Grossbeck.

Semiophora atoma n. sp.

Ground color of the usual light red brown, more or less washed with gray, so that in some cases the general impression is gray rather than brown. Head and thorax concolorous, save that the front may be gray in a brown specimen, and the sides of the palpi are deep blackish-brown. Primaries more or less powdered with black atoms, some specimens very evenly irrorate, with all the usual markings either obsolete or very faintly defined. In the best marked example there is a broken black basal line, marked by scattered scales. T. a. line marked by an oblique dusky costal streak in all specimens, below that lost or traceable obliquely to near the middle of inner margin. T. p. line usually marked on costa, below that lost or obscurely marked by blackish scales, indicating a small even outcurve over cell and as moderate an incurve below it. S. t. line very faintly indicated by a slightly darker preceding shade. Ordinary spots altogether lost or very vaguely defined. Orbicular large, round or nearly so; reniform large, broadly kidney shaped. The spots are either concolorous and have a few black scales indicating outlines, or they are a trifle paler and have no defining scales. Secondaries smoky, with an obscure discal lunule, fringes rosy. Beneath carneous, powdery, primaries with disc smoky and with a faint extra median line; secondaries paler, more brightly rosy, with a small discal spot and a better marked discal line.

Expands 1.17–1.35 inches = 29–34 mm.

Hab.—Lakehurst, N. J., September 27th.

One male and nine females, mostly in fair condition. The male is very much rubbed, but has legs and antennæ intact, so as to warrant the generic reference. The females are mostly flown, but are

otherwise in good condition. This is distinctly the smallest species in this series and characteristic by the almost complete absence of maculation. The pectinations of the male antennæ are as in *elimata*. The specimens were taken at sugar by Mr. J. A. Grossbeck.

Setagrotis filiis n. sp.

Ground color bluish-ash-gray. Head more whitish, palpi black at the sides. Collar with a blackish median line, inferiorly a little paler. Thoracic tuftings distinct, patagia with a black line at base of wings. Primaries with the transverse maculation obscure, except for the t. p. line, which is marked by venular pale dots, the tendency being toward a strigate type which is not, however, very conspicuously developed. There is a narrow black basal streak marked by a paler gray shade which extends into an outward angle of the t. a. line nearly to the middle of the wing, and beyond which a narrow obscurely marked claviform extends across the median space. The basal line is marked by geminate oblique streaks on the costa. T. a. line broken, partly lost, with long outward teeth in the interspaces, geminate, with gray included spaces. T. p. line irregularly crenulate and denticulate, incomplete, but marked on the veins by a series of gray dots, which after the abrupt outcurve on the costa, run almost parallel with the outer margin. S. t. line lost, the interspaces toward the margin with diffuse smoky shadings. There is a narrow pale line at the base of the gray fringes. Orbicular very narrow, oblique, gray filled, open toward the costa, narrowly black margined and extending to the inferior angle of the reniform, but not fused with it. Secondaries rather evenly smoky, the discal lunule and median line of underside showing through. Beneath: gray, powdery, costal region of both wings with a reddish tinge; a common crenulate extra-median line and a smoky discal lunule.

Expands 1.40 inches = 35 mm.

Hab.—Pullman, Washington, August 21, 1897.

One male, in good condition, from Prof. C. V. Piper. This species has been in my collection for many years associated with the female of *dernarius*, also now described. I could never decide whether I had one species in which the sexes differed markedly or whether there were two allied species, and therefore waited for additional material. The occurrence of a male *dernarius* has enabled me to decide the question satisfactorily. The antennæ are serrated and bristle tufted, and the species is allied to *vernilis* in type of maculation. As I cannot actually demonstrate any spinulation of the fore-tibia, perhaps a generic reference to *Anomogyna* as defined by Hampson may be better; but as in *dernarius*, which is closely allied, there are none visible in the female, though they are obvious in the somewhat defective male, I prefer to hold the species here for the present, until more material will enable the question to be settled.

Setagrotis dernarius n. sp.

Ground color dull smoky brown, tending to more reddish-brown. Head paler brown, with an admixture of white scales and a narrow black median transverse line; palpi blackish at sides. Collar with two darker and two paler brown lines, and whitish at tip. Thoracic disc gray; the patagia mottled with blackish scales. Primaries grayish, powdered along the costal region, this powdering extended also in the basal and s. t. spaces, and somewhat along the inner margin, leaving a darker longitudinal shading through the centre of the wing. The transverse maculation is lost or modified to a strigate type. There is a narrow blackish basal streak extending to an angle of the t. a. line and beyond this an obscure claviform reaches to the middle of the wing. Basal line geminate, marked by oblique costal streaks only. T. a. line geminate, strongly dentate, broken, included space whitish, and this whitish included line is all that remains in the median cell. T. p. line marked by venular black and pale dots, on the whole parallel with the outer margin. Veins black lined, interrupted on the t. p. line, and accompanied by white shades on veins 3 and 4, so as to cut the terminal space to the outer margin. No obvious s. t. line. A series of small blackish terminal lunules. A pale line at the base of the dusky fringes, which, opposite the veins, are narrowly cut with paler brown. The orbicular is narrow, very much elongate, a little oblique, ringed with whitish, centred with brown. It does not quite reach the reniform, which is broadly ovate, dusky, incompletely outlined. Secondaries whitish, with a yellowish tinge, the outer border darker and with darker powderings on the veins; discal lunule blackish. Beneath: gray, powdery; primaries with disc smoky, with a broad outer smoky line and a discal spot; secondaries more whitish below the costal region, with a punctiform outer line and a narrow discal lunule.

Expands 1.23–1.38 inches = 31–34 mm.

Hab.—California, W. D. Urban, 1906, 106; Easton, Washington.

One male, the smaller example from California, was sent by Sir George F. Hampson for identification, and is somewhat defective and rubbed; one female, the larger example from Washington was probably from Prof. Piper's lot, although not dated and without his label; but it is an almost perfect specimen, and from it the description was chiefly made. As already noted I had the male *filiis* associated with this female until the specimen from the British Museum furnished an exact mate to it. In this male the antennæ are very strongly serrated and tufted, and the spines on the anterior legs are obvious. This, therefore, belongs to *Lycophotia* as defined by Hampson and to which *Setagrotis* is referred as a synonym. For the present I am not quite ready to agree to this, and therefore hold to my generic reference.

Setagrotis ducalis n. sp.

Ground color dull powdery luteo-fuscous. Head, except front, whitish; palpi with white intermingling hair. Collar inferiorly white, limited by a median brown line, above which there are blackish scales. Thoracic vestiture defective

in the specimen, but apparently the disc was whitish, powdered centrally. Primaries white, powdered along costa, on the median vein, at the base and, in the s. t. space, over veins 3, 4, 6 and 7. Basal line geminate, blackish, broken, marked on the costa and below the median vein. T. a. line geminate, broken, black, angulated in the interspaces. T. p. line single, feebly crenulated, very narrow, blackish, evenly outcurved over the cell and almost rigidly oblique below the curve. S. t. line marked by the smoky terminal space and the preceding white powdering to vein 3, below which it is whitish, broad, somewhat diffuse to the hind angle. On veins 3 and 4 the whitish powdering indents the terminal space and on veins 6 and 7 there is another outward extension which leaves an inward angular extension of the terminal space. Apex pale. There is a series of distinct black interspaceal terminal lunules. Fringes luteous at base, darker outwardly. As a whole the median space is darker than basal and s. t. spaces, and not quite so dark as the terminal space; the cell, except for the ordinary spots, blackish. Claviform small, incompletely outlined by blackish scales, paler than the ground, the pale shade extending outward through the submedian interspace to the t. p. line. Orbicular small, oblong, oblique, defined by black scales, with a broad white annulus; centre luteous. Reniform of good size, kidney shaped, white ringed within the black border, centered with luteous. Secondaries smoky, paler, more lutcous at base, fringes white. Beneath: primaries with disc smoky, the borders white, a series of small, black, terminal dots. Secondaries white, powdery along the costal region, smoky along the outer border, with a small dark discal dot.

Expands 1.40 inches = 35 mm.

Hab.—Stockton, Utah.

One female in excellent condition, except for the vestiture of thoracic disc, and probably directly or indirectly from Mr. Tom Spalding. At first sight this resembles an *Euxoa* of the *4-dentata* series; but although no male is at hand I think the present references will hold.

Euxoa moxa n. sp.

Head, thorax and primaries a rather dull creamy gray. Head with a slightly rusty tinge, which extends to a greater or less degree on to the collar. Primaries with a pale, slightly sinuate s. t. line through a smoky outer shade, and a pale ringed reniform of moderate size in which is a blackish inferior diffuse spot. All the other maculation is lost. It is possible to make out a round orbicular of moderate size by a few black scales and a vague paler ring; and so the course of the median lines is indicated, if one knows exactly what to look for. Fringes rusty, with a yellow interline. Secondaries smoky yellowish in both sexes, a little paler in the male, fringes pale; a narrow discal lunule. Beneath: powdery gray, primaries with disc smoky, all with a small discal spot; in the female there is a broken exterior line on all wings.

Expands 1.40–1.50 inches = 35–37.5 mm.

Hab.—Colorado, Glenwood Springs; Durango, July 8th to 15th. One ♂ and one ♀ in good condition. The species is allied to

scandens in simplicity of maculation; but the median lines are even more completely lost, the s. t. line is less contrasting, the color is darker and the secondaries in both sexes are dusky. The species is also rather more robust in appearance than the other closely related forms.

Euxoa epictata n. sp.

Head, thorax and primaries pale reddish-gray, the latter powdered with darker gray. Head and thorax concolorous. Primaries with the ornamentation just traceable, except for the reniform which is lunate, moderate in size, blackish-gray, ringed with pale, but not sharply defined. Basal line geminate, marked on the costa and median vein by smoky dots. T. a. line geminate, hardly relieved, outwardly oblique, evenly angulated in the interspaces. T. p. line geminate, even, oblique, feebly sinuate. S. t. line of the ground color, irregular, marked by an obscure powdering that darkens the outer portion of the wing. A series of narrow terminal lunules which form an almost continuous line, and a pale line at the base of the fringes. Orbicular round, concolorous or slightly darker, marked by a diffuse slightly paler annulus. Secondaries whitish, with a narrow smoky outer border. Beneath: whitish, primaries powdery, with the discal spot of upper side faintly reproduced; secondaries powdery along the costa.

Expands 1.40–1.48 inches = 35–37 mm.

Hab.—Southern Arizona, April 15th to 30th, Poling.

Two ♂ and six ♀, all in fair condition. The species has a resemblance to a faded *Orthosia lutosa*, and was at first placed with the material in that genus. It belongs to the *pitychrous* section and has no close allies.

Schinia sara n. sp.

Ground color reddish-luteous, intermingled or overlaid by rusty or dull brown scales. Head and thorax concolorous. Front scarcely tumid and not noticeably roughened. Primaries: basal space chocolate or rusty-brown, s. t. space scarcely paler, but tending to become interrupted at its middle; median and terminal spaces almost concolorous and more powdery. Median lines pale, even, defined by an edging of somewhat darker scales or the contrasting shades of basal and s. t. spaces. T. a. line with a rather even outcurve, the angle above the middle of the wing. T. p. line distinctly bisinuate. S. t. line a little irregular, pale, chiefly marked by the difference in shade between s. t. and terminal spaces. A dusky indefined reniform. Secondaries yellowish, with rusty brown powdering, hardly more obvious outwardly. Beneath pale, outwardly powdered with reddish or brown scales, less so on secondaries.

Expands 1.00–1.12 inches = 25–28 mm.

Hab.—Wilgus, Cochise Co., Arizona.

Two females, in fair condition. This is an ally of *oleagina* Strck., but differs altogether in the course of the lines and in the contrasts between the spaces. The anterior tibia has a long curved inner and

a shorter outer claw at tip, and above these the usual smaller spines. In the U. S. N. M. are specimens from the Organ Mountains, New Mexico, viii, 30, and ix, 4, elevation 5,300 feet.

Schinia buta n. sp.

Ground color pale creamy, mingled and overlaid by somewhat glossy reddish-gray scales, which gives the entire insect a soft reddish-gray appearance. Head and thorax concolorous, front tumid. Primaries with median space paler than basal and terminal spaces and more powdery, well defined by the broad, whitish, even median lines. T. a. line inwardly bordered by darker scales, moderately outcurved, the angle of the curve on the median vein. T. p. line outwardly bordered by dusky scales, very evenly and slightly sinuate. There is no s. t. line. The reniform is oblong, slightly darker than the ground, not defined, and from it a very faint median shade line extends to the middle of the inner margin. Secondaries of much the same general tint as primaries, more thinly scaled, a little paler at base. Beneath: uniform powdery reddish-luteous, secondaries with a slightly darker shade band outwardly.

Expands 1.15 inches = 29 mm.

Hab.—Los Angeles County, California.

One good male. It differs from all its immediate allies in the entire absence of the s. t. line and in the general agreement of tint between the two pairs of wings. The tibial armature is characteristic of the genus: one long outer claw with a series of smaller spines above, a shorter inner claw and two shorter claw-like spines above.

Schinia ernesta n. sp.

Ground color pale creamy yellowish, with an overlay or intermingling of reddish scales. Head and thorax concolorous. Front slightly tumid, a little roughened. Primaries somewhat darker beyond the t. p. line, all the maculation very obscure. T. a. line slightly darker than the ground, preceded by a slightly paler shade outwardly bent from costa, with the angle in the middle of the cell, evenly oblique below. T. p. line a little paler than the ground, preceded by a narrower darker line and outwardly defined by the darker s. t. space, very slightly sinuate. S. t. line a little paler than the ground, not sharply defined, almost parallel with the outer margin. A vague slightly darker reniform. Secondaries glossy yellowish, scarcely darker outwardly. Beneath: primaries yellowish at base, pinkish-red beyond the middle; secondaries yellowish.

Expands 1.12 inches = 28 mm.

Hab.—Garfield Co., Colorado, 5000 feet.

One good male from Mr. David Bruce. It bears a superficial resemblance to *buta* in color, and a closer one to *sara* in maculation, but is distinct from the former by the presence of the s. t. line and from the later in the color and course of the median lines. The anterior tibiæ are wanting, and the armature is assumed to be similar to that of *buta*.

Tæniocampa saleppa n. sp.

Ground color red-brown. Head and collar paler, more yellowish or rusty; dorsum uniform dark red-brown. Primaries varying from an even dark red-brown to a mottled powdery dark brown over a yellowish-brown base. Median lines usually obscured and broken by the mottlings, but in a uniformly colored example all the lines are completely defined. Basal line brown, obscurely geminate, marked only in costal region. T. a. line single, rusty-brown, nearly even and only a little outwardly oblique. T. p. line single, a little crenulated, with an even outcurve over the cell and a deep incurve below, so that the space between the median lines on inner margin is very narrow. S. t. line pale, very nearly parallel with outer margin, usually indicated by the difference between the paler terminal and darker s. t. space; but when there is no such difference then by an indefined line of the palest ground. A series of blackish venular dots before the margin. A very narrow crenulate blackish marginal line, followed by a pale line at base of fringes. Margin a little scalloped. Claviform wanting. Orbicular of good size, oblique, a little or no paler than ground color, defined by blackish scales, tending to become open to costa and to unite with the reniform inferiorly, the union becoming complete in some cases. Reniform moderate in size, kidney-shaped, outlined by a narrow pale ring, uniformly darker than the ground, but not contrasting. Secondaries smoky, with coppery-brown powderings, with a blackish discal spot and a blackish terminal line. Beneath: rusty-yellowish, with coppery-brown powderings, all wings with a large blackish discal spot, a crenulated terminal line and an obscure extra-median line, which is best marked on the costa.

Expands 1.40–1.56 inches = 35–39 mm.

Hab.—British Columbia; Wellington, April 12th, 14th; J. Bay, Victoria, August 17th.

Four males and one female in fair or good condition, the Wellington examples from W. J. Bryant. The species is allied to *præses*, and while no two examples of either species are alike, there is no chance of confounding the two.

The male antennæ are serrate and bristle tufted, and the species would be referred by Hampson to his *Perigrapha*, Section III, as an ally of *præses* and *transparens*, with which it also agrees in wing form and thoracic tufting.

Orthosia straminea n. sp.

Head, thorax and primaries dull straw-yellow; abdomen and secondaries uniform smoky. Maculation of primaries a little more brownish, the lines not relieved, incomplete, the space beyond the t. p. line smoky, relieving the pale somewhat irregular s. t. line. Basal line single, obscurely indicated. T. a. line very faint, single, with outward angulations in the interspaces. T. p. line slender, broken, irregular, followed by small venular black dotlets. The veins are somewhat darker through the terminal space, and there is a series of interspaceal terminal lunules. Orbicular of good size, nearly round, concolorous, ringed with brownish. Reniform large, centrally a little constricted, brownish ringed, black-

ish filled inferiorly, else concolorous. Beneath dull pale yellowish, a little smoky outwardly. all wings with a blackish discal spot.

Expands 1.12 inches = 28 mm.

Hab.—Glenwood Springs, Colorado, October 16th to 23d.

One good male, from Dr. Barnes. This is an ally of *ferruginoides*, than which it is smaller, much more obscurely marked, with dusky secondaries and a dusky outer border to the primaries. The antennæ have the joints marked and fasciculate.

Orthosia acta n. sp.

The ground color varies from very pale reddish-gray, with a yellow tinge to almost rusty red-brown, the markings always a deeper shade of the ground color so that while they are distinct they are never contrasting. Head and thorax concolorous. Basal half line distinct, single, even. T. a. line geminate, inner portion faint, outer distinct, included space a little paler than the ground; in course oblique, with two well-marked inward angulations so that it looks like a widened W. T. p. line geminate, outer portion obscure, included space a little paler, inner line fairly defined, lunulate, as a whole with an even, moderate outcurve over the cell and a very feebly marked incurve below. The median shade band is very distinct, narrow, a little diffuse, a little oblique from costa between the ordinary spots to the lower angle of the reniform, then a little inwardly oblique to the inner margin nearly at its middle. S. t. line pale, preceded by a neat well-defined rusty brown shading, a little irregular, as a whole parallel with the outer margin. A series of small terminal lunules. Claviform moderate in size, concolorous, outline not well defined. Orbicular outlined in red-brown, concolorous, large, nearly round. Reniform large, upright, only a little constricted, with narrow red-brown outline, concolorous, except for a leaden-gray inferior spot. Secondaries very pale yellowish, immaculate. Beneath: yellowish, with a reddish tinge, powdery, secondaries paler, both wings with an extra-median dusky line and a discal spot.

Expands 1.28–1.36 inches = 32–34 mm.

Hab.—Corvallis, Oregon, September 27th and November 3rd; Pullman, Washington, October 20th; Corfield, Vancouver, September 9th; Livingston, Vancouver, September 5th.

Five ♂ and one ♀, all in fair or good condition. The wing form is like that of *verberata*, a little more elongate and pointed than *bicolorago*, and in the uniformly yellowish secondaries this species resembles *decipiens*, with which, indeed, it has been confused. The ♂ antennæ have the joints marked and fasciculate, the thoracic vestiture is hairy, forming no distinct tufts. From *decipiens*, which is a large eastern species resembling a washed out *ferruginoides*, this species differs by the neatly marked ornamentation and smaller size.

Orthosia antapica n. sp.

Ground color a rusty reddish-gray, more or less powdered with smoky or blackish scales, so that some examples seem to have been washed with sooty particles. Head and thorax concolorous. Primaries with all the markings defined, usually clear in the less powdery, obscure in the darker examples, the median shade line always the most obvious of the transverse markings, lower part of reniform conspicuously darker, a dark brown or blackish costal patch preceding the s. t. line always the most conspicuous portion of the wing. Basal half line geminate, broken, a little irregular. T. a. line geminate, the two portions almost equally distinct, included space concolorous, outwardly oblique, outcurved in the interspaces, a little drawn in on the veins. T. p. line geminate, the lines almost even or the inner a little lunulate, in course a little irregular, not much outcurved over the cell and not much drawn in below it. Median shade narrow, with diffuse margins, but well defined, outwardly oblique from costa between ordinary spots to inferior half of reniform, there angled and inwardly oblique to the middle of the inner margin. S. t. line preceded on costa by a conspicuous dark blotch, thence punctiform, consisting of a series of interspaceal blackish dots, followed by a very obscure pale line. A series of interspaceal dark lunules a little before the margin of the wing. The s. t. space is sometimes a little darker than the rest of the wing. Claviform barely traceable by brown outlining scales. Orbicular oval, oblique, of good size, incompletely and narrowly outlined in brown. Reniform large, oblique, a little constricted centrally, narrowly defined by brown scales and a slightly paler ring. Secondaries smoky, with a more or less reddish tinge, a smoky discal lunule; a narrow terminal smoky line, preceded by a paler margin. Beneath: reddish to smoky, powdery, with a large smoky discal spot on all wings, and a more or less obvious extra-median line.

Expands 1.36–1.46 inches = 34–36 mm.

Hab.—Corvallis, Oregon, October 6th, 8th and November 3rd, 11th; Corfield, Vancouver.

Three ♂ and three ♀. The wing form is like that of *purpurea* Grt., which this species resembles in some points. The type of maculation is more like that of *verberata* and the secondaries are similar; but the punctiform s. t. line will serve to distinguish this form. The ♂ antennæ are ciliate rather than fasciculate, the thoracic vestiture is hairy, and there is a neat little anterior crest.

Orthosia fornica n. sp.

Ground color rather pale, even, red-brown; head and thorax concolorous; primaries with median lines scarcely relieved, the leaden gray spot in reniform and black costal mark at inception of the punctiform s. t. line being the prominent features. T. a. line geminate, with rather even outward angulations in the interspaces. T. p. line mostly marked by the difference in tint between median and s. t. spaces, with little outward rays on the veins, only a little curved over cell. Median shade rather well defined, brown, outwardly bent from costa to reniform inferiorly, then inwardly oblique to margin. S. t. line marked by a series of black interspaceal dots. An obscure brown terminal line, followed by a pale line at base of fringes. Claviform indicated by a partial outline. Orbicular large,

concolorous, incompletely brown ringed. Reniform large, slightly constricted, inferiorly dusky. Secondaries very pale, smoky yellow, with a rosy flush; a vague s. t. darker shade and smoky discal spot. Beneath: rosy reddish, primaries paler, all wings with discal spot.

Expands 1.12 inches = 28 mm.

Hab.—Southern California.

One male in good condition, save that it lacks antennæ and the tips of primaries are a little broken. I have no data as to the source of the specimen. It resembles *antapica* in a general way, but is smaller, more even in tint, without the contrasts that distinguish the larger species.

Orthosia aggressa n. sp.

Ground color a very pale luteous gray. Head and thorax concolorous. Primaries with basal and outer area washed with bluish-gray, leaving the median area more dull in appearance. Basal line indicated on the costal region. T. a. line geminate, smoky, even, with an even oblique outcurve to inner margin. T. p. line geminate, blackish, even, only a little outcurved over the cell. Median shade smoky, distinct, outwardly oblique from costa to reniform inferiorly, then parallel with t. p. line to inner margin. A smoky costal blotch between s. t. and t. p. lines. S. t. line punctiform, consisting of smoky, somewhat lunate interspaceal spots outwardly marked by paler scales. Fringes dusky, with a series of vague terminal lunules preceding them. Orbicular large, irregular, concolorous, scarcely defined. Reniform large, upright, a little constricted, inferiorly dusky, else not well defined. Secondaries paler, more transparent yellowish, with a smoky suffusion in the female. Beneath: dirty white, more or less powdery, usually with discal spots on all wings, and on secondaries sometimes an extramedian dusky line.

Expands 1.12–1.25 inches = 28–31 mm.

Hab.—Colorado, Denver, July 8th; Gunnison, July 9th; Chimney Gulch, July 16th; Clear Creek Canon, August 24th; Cartwright, Manitoba.

Five ♂ and one ♀, mostly poor. Quite readily distinguished by its very pale gray color and very even median lines. The ♂ antennæ are ciliate only.

Homoglæa dives n. sp.

Head and thorax deep blackish-brown, the thoracic vestiture becoming black over the base of the abdomen. Primaries deep red-brown, paler along the inner margin and becoming darker until at the costa the color is almost purplish-black. The median lines are geminate, deeper velvety brown, not contrasting but readily made out, in course like those of *carbonaria*, of which this is an ally. Median shade rich brown, better marked than median lines, angulated at the inferior angle of the reniform, which may be invaded by the darker shade. S. t. line irregular, pale, preceded by blackish scales, which, on the costa, form a distinct

contrasting spot. Orbicular large, irregular, outlined by black scales. Reniform large, upright, a little constricted, outwardly margined with yellow scales and a line of yellow scales centrally. Secondaries blackish. Beneath: dark smoky, with a purplish wash, paler on secondaries on which is also a discal spot.

Expands 1.65 inches = 41 mm.

Hab.—Corvallis, Oregon, March 11th (Cordley); Wellington, British Columbia, April 14th (Bryant).

Two good females, associated with *carbonaria*, but abundantly distinct by the characters just pointed out. *Carbonaria* is locally rather common, and I have had a great many examples under examination, so that I am familiar with its range; but I never had specimens like these taken with that species.

Aleptina luteomedia n. sp.

General ground color ashen-gray, ornamented and washed with luteous and deep brown or black. Head usually, and often the collar also, luteous, with a reddish tinge. Thoracic disc leaden-gray or darker, this shade sometimes involving the collar and in one example the head as well. Primaries ashen-gray, with a luteous shading, which starts from costa at base, curves through the middle of the wing without quite reaching the inner margin and terminates on the outer margin below the apex. Inferiorly this shading is quite well limited; but superiorly it merges gradually into the gray which extends to costa. The usual median lines are much obscured and barely traceable. At base a deep brown shade limited by a black line, extends obliquely outward to the inner margin, limiting the luteous shade inferiorly, and a brownish or blackish powdering extends along the inner margin to the point where it meets a curved blackish-brown shade which forms an inner shading to a white line which extends from the middle of the outer margin, with an incurve to the inner margin well within the anal angle. This line is a little irregular and has a distinct tooth on vein 1. From the apex a narrow blackish shade band extends obliquely inward to the lower angle of the cell, forming here an inner margin to the luteous shading. On the costa there is a dusky shade before and after the orbicular. The orbicular is small, round, concolorous, clearly defined by a narrow black ring and with a black central dot. The reniform is vaguely indicated at the end of the cell. The claviform has in one example, an outline of rusty brown scales. There is a series of leaden-gray or black terminal dots or spots, beyond which the fringes are cut with the same color. Secondaries white, with a series of black terminal spots, a variably evident broken extra-median shade line, and a small black discal spot. Beneath: primaries powdery, smoky along the costal region, very pale yellowish toward the margins, orbicular faintly reproduced, reniform marked by blackish scales and more evident than above. Secondaries white, with a distinct lunate black discal mark, a series of black terminal lunules, and a more or less evident extra-median line marked on the veins only.

Expands .85–1.10 inches = 21–27 mm.

Hab.—Southern Arizona, Poling, August 1st to 15th; Yavapai County, Arizona, Hutson, May 22nd; Baboquavaria Mts., Arizona, Snow.

Four males and two females, in fair to good condition, and all the males decidedly smaller than either of the females. Though the specimens are all in good condition so far as primaries are concerned, three of them have been papered, and the others have the abdomen greasy or rubbed so that the character of the tufting is obscured. It seems probable that the patagia are a little uplifted, that there is a somewhat prominent posterior tuft on the thorax, and that there is a series of little abdominal tufts, at any rate in the male. The frontal process is long, longer in the male, flattened above, the tip a little emarginate so as to leave two prominent points, the process becoming transversely compressed inferiorly, so that at tip, when seen from the front, it looks almost T-shaped, with the ends prominently produced.

Oxycnemis baboquavaria n. sp.

Ground color light ashen-gray, dusted and shaded with smoky brown, the maculation black, female darker than the male. Head and thorax uniformly mottled with gray and brown, the posterior thoracic tuft metallic-bronze tipped, conspicuous. Primaries with the usual markings evident, neatly written. Basal line single, black, distinct, extending to the middle of the wing. T. a. line upright or nearly so, rigid, or with only a little outward angulation at the middle, black, preceded by whitish scales. T. p. line single, black, outwardly shaded with white scales, inwardly oblique from costa not far from apex to vein 3, thence with a decided incurve to vein 1. S. t. line obscurely indicated by a slight difference in shade between the s. t. and terminal spaces. A continuous narrow black terminal line. Fringes of the ground color, obscurely cut with smoky brown. Claviform large, loop-like, extending half-way across the cell, narrowly outlined in black, with a whitish line within; else concolorous. Orbicular round or broadly oval, of good size, black and white ringed, usually paler than ground. Reniform large, broadly lunate, oblique, narrowly outlined in black within which is a whitish ring in the female and a whitish filling in the male. A whitish shading in the cell from t. a. line extends outward to the costa at t. p. line; a somewhat darker shading fills the middle of the median space; a decidedly darker shade extends obliquely inward from within apex to the middle of the wing, best marked below the apical region. Secondaries pale smoky in the male, darker and more uniform in the female, fringes white; in the ♂ an obscure extra-median line. Beneath: primaries smoky, secondaries whitish, powdery, with an obscure outer line and discal lunule.

Expands .92 (♂)–1.05 (♀) inch = 23–26 mm.

Hab.—Baboquavaria Mts., Pima County, Arizona, July 15th to 30th, 1903, O. C. Poling.

Two males and two females, in good condition. The males, besides being the smaller, are also lighter in color and more contrastingly marked, the basal space distinctly white powdered. The

markings are very uniform, however, and there is not enough range of variation to cause doubt. The species is allied to *sectilis* in general type of maculation, but the head and thorax are not brown, and the maculation is black instead of brown. From *advena* it is distinct by the obvious t. p. and s. t. line, the reverse being the case in Mr. Grote's species. We have, evidently, a little series of closely allied and very local forms in this genus.

Oxycnemis gustis n. sp.

Bright bluish-ash-gray; head and thorax darker, almost blackish, with white intermingled hair and scales. Thoracic tuft distinct, with metallic lustre. Primaries with the cell whitish filled, basal space strongly white powdered, a diffuse whitish shading beyond the incurve of the t. p. line and a well-defined oblique smoky shading from costa within apex to the base of reniform. Basal line obvious, upright, blackish, a little diffuse. T. a. line a little oblique, with a slight outward tooth at middle, blackish, diffuse. T. p. line narrower, not sharply defined, blackish, squarely exserted over cell, with a decided incurve in the submedian interspace. S. t. line vaguely indicated by a whitish shading and a somewhat darker powdering in the terminal space. A distinct, black continuous terminal line at the base of the concolorous fringes which are narrowly cut with smoky brown. Claviform obscurely outlined by blackish scales, large, broad, scarcely relieved from the surrounding space. Orbicular round, of moderate size, obscurely outlined by gray scales. Reniform broadly lunate, gray, not well defined, outwardly obscured by the oblique subapical shading. Secondaries white, costal region and a narrow outer border smoky and powdered; fringes white. Beneath: primaries smoky, costa whitish powdered, a distinct brown terminal line, the fringes narrowly cut with white. Secondaries white, with a smoky powdering in the costal region and a narrow outer line.

Expands .85 inches = 21 mm.

Hab.—Southern Arizona, August 1st to 15th, Poling; one good male.

This is allied to *baboquavaria* in type of markings, but is smaller, paler gray, with diffuse markings and darker head and thorax. Judging from the allied species the female will be larger and darker and may be more definitely marked. I do not remember having seen this form in other collections.

Oxycnemis yuma n. sp.

Ground color gray over a luteous base. Head a little less powdery than the thoracic disc, but as a whole both are powdered with black scales, which are more massed posteriorly on the tuft, which is less prominent than in the type form and not metallic. Abdomen yellowish or whitish like the secondaries. Primaries with all the transverse maculation obscure, strigate with white and black. A dusky shading extends from apex to the inner margin within the anal angle and this in part relieves the very irregular and fragmentary, diffuse pale s. t. line. The claviform extends from base to beyond the middle of the wing, is narrow,

edged with a fine black line, and this in turn edged by a more or less obvious layer of white scales. The ordinary spots are fused, the long narrow orbicular joining the reniform at its middle. A narrow black line inwardly edged with white scales defines the combined stigma. There is a distinct, rather broad, continuous black terminal line, beyond which the fringes are gray and white lined. There is a whitish shade preceding the oblique dark shade on costa just before the apex and sagittate black spots precede the s. t. line in part of its course. Secondaries whitish in the male, smoky in the female, a little darker outwardly in both cases and with a darker terminal line basing the white fringes. Beneath: powdery; primaries with the disc smoky and a white line at the base of the fringes which are also cut with white; secondaries with an obscure discal lunule, a punctiform extra-median line and a smoky terminal line.

Expands .72-.84 inches = 18-21 mm.

Hab.—Yuma County, Arizona, in April; Walters Station, California, in April (Hutson); Gila County, Arizona, in June (Poling); Kerrville, Texas, May 24th to 30th (Dr. Barnes).

Five male and thirteen female specimens, mostly in good condition and mostly of the desert material sent in by Mr. Hutson. There is a little variation in the distinctness of maculation, and the males are uniformly smaller and paler than the females. In the strigate type of maculation this species resembles *fusimacula*, but is smaller and with more obtuse and broader primaries. From the more typical species it is separated by the character of the posterior thoracic tuft, which is not metallic and does not consist of broadly flattened scales. It is really more like a very small *Oncocnemis* of the *chandleri* group, and not unlike *gracillima* Grt.

Oxycnemis adustus n. sp.

Ground color dull ashen-gray over luteous. Head chocolate-brown in front, vertex and thorax powdered with black scales, posterior tuft a little darker. Primaries obscurely marked. Basal and t. a. lines lost. There is a long concolorous claviform, very faintly indicated by scattered white scales, which extends nearly to the t. p. line. The t. p. line is smoky brown, single, followed by a narrow paler shade, acutely angled over the cell, thence evenly oblique to the inner margin a little beyond the middle, both brown and pale shadings better marked toward the margin. S. t. line very irregular, broken, whitish, preceded by darker shadings and interspaceal black lines; forming more conspicuous blotches opposite the cell and in the submedian interspaces. There is a whitish streaking from the inner costal inception of the s. t. line and the reniform. The ordinary spots are concolorous, narrowly and obscurely white ringed, confluent, the elongate orbicular entering the centre of the reniform. Terminal line black, distinct, continuous, the fringes gray at base and with a yellowish interline. Secondaries smoky whitish, darker at the outer margin, fringes white. Beneath smoky, primaries more luteous, with broad fringes alternately lined with white and gray; secondaries whitish.

Expands .68 inches = 17 mm.

Hab.—San Antonio, Texas.

One rather defective male which would not have been described at this time but for its obvious relationship to *O. yuma*. In thoracic vestiture it is like that species, and so it is in the general type of maculation; but it is much less irrorate and strigate in appearance, and such markings as are present are not nearly so well defined.

Stibadium hutsoni n. sp.

Color a bright olivaceous-gray. Head whitish; frontal process cylindrical, depressed at tip so as to leave a sharp rim, from the central lower margin of which a transversely flattened wedge-like process extends upward and outward a little beyond the rim. Thorax pale olivaceous, vestiture composed of flattened hair; tuftings not marked in the specimens. Primaries olivaceous, with a broad paler median band that does not quite reach the costa; a narrower pale shade band from outer third of inner margin to apex, a little waved and not so obvious at apex; an obscure paler shading from hind angle along outer margin to the apex; in the male traceable to a union with the extra-median pale shade band. Fringes olivaceous. Secondaries uniformly smoky brown. Beneath: primaries almost uniformly smoky; secondaries whitish, with an ochreous tinge.

Expands .80-.85 inches = 20-22 mm.

Hab.—Yuma County, Arizona, March 23rd; Walters Station, California, April 20th.

One male and one female in fair condition, both taken by Mr. Hutson in the same kind of desert area, though in different States. The rather even olive-green and the obvious, broad, pale median band are characteristic of the species.

Stibadium fuliginosa n. sp.

Ground color dull, smoky luteous, with a tendency to olivaceous. Head tending to paler, more whitish, frontal structure as in *hutsonii*. Thoracic vestiture an intermingling of scales and hair, the tuftings defective in the specimens. Primaries with a narrow pale band extending from the outer third of inner margin diagonally, nearly to the apex. Secondaries smoky, scarcely paler at base. Beneath: uniformly smoky, secondaries scarcely paler than primaries.

Expands .72-.84 inches = 18-22.

Hab.—Walters Station, California, April 20th; Phoenix, Arizona, April 1, 1897.

Five males and four females in fair condition as to wings; but the thorax compressed or with defective vestiture in most cases. All except one female were sent in by Mr. Hutson, the latter from the Hulst collection and much paler than any others. Three females and two males agree strictly with the above description. In one female the outer line is broader, a little less rigid, extends to the apex, and there is a pale marginal band extending the entire length

of the outer margin. One male matches this female, except that the pale shades are much less marked, and in two males there is a tendency to the median shade which occurs in *hutsoni*. There is a possibility that this is only an extreme form of *hutsoni*, or that two of the examples referred here are really variations of the other species.

Perigea morsa n. sp.

Ground color dull fuscous-brown, without obvious shadings or contrasting maculation. Head and thorax concolorous with primaries, collar with a black subapical line, abdomen only a little lighter. Primaries with all the lines punctiform, basal and median lines geminate, incomplete and variably defined. S. t. line preceded by a black, narrow, defining shade, which may be very distinct and quite sharply marked, or may be just obvious. The cell, except for the ordinary spots is shaded with blackish; but not sharply contrasting. Basal line obvious in all the specimens; inner part tending to become complete. T. a. line a little oblique, irregular in the interspaces, dissimilar in the specimens. T. p. line quite even, in some cases almost parallel with the outer margin, in others a little more outcurved over the cell and a little drawn in below. S. t. line quite irregular, drawn in below apex, above vein 5 and above the anal angle. A series of obscure dusky terminal lunules. Claviform marked only by black scales, of moderate size, obscure. Ordinary spots not outlined and incompletely defined; orbicular nearly round and of moderate size; reniform large, a little drawn together at middle; both spots usually a little lighter than the rest of the wing and not powdered with blackish scales. Secondaries: in the male whitish, with a dusky outer margin; in the female evenly dull, smoky. Beneath: dull brown, powdery, secondaries much paler, both wings with a distinct dark exterior line; secondaries with a discal spot.

Expands 1–1.12 inches = 25–28 mm.

Hab.—Brownsville, Texas, in June.

Two males and two females in only moderate condition, from Prof. F. H. Snow. In wing form and, indeed, in general appearance, this resembles *claufacta;* but it is decidedly smaller and there are no abdominal tuftings. In maculation the continuous dusky or blackish s. t. shade is always at least obvious, and the dark shadings of the median cell attract attention.

Acontia cacola n. sp.

Head and disc of thorax chocolate-brown, with a metallic lustre, collar and lateral margins of patagia white. The head tends to a paler tint, and the brown scales may be rubbed so as to make confusion possible in a defective specimen. Abdomen not banded. Primaries with the markings chiefly brown, lustrous; no complete transverse maculation. A black ovate patch fills the inferior half of the basal space. The inception of the t. a. line is indicated by a small brown spot. There is a brown costal spot at the inception of the t. p. line, and this varies in

size from a mere dot to a blotch and may be geminate. The t. p. line is traceable in some examples by dotted marks until it merges into the large brown patch that occupies the third quarter of the inner margin and extends upwards to the middle of the wing. This patch is not of solid color, but rather of wavy bands, and the t. p. line is indicated by black scales. There is another brown blotch at the apex, and in this the s. t. line is marked by intensely black scales. In all the brown patches there are some metallic-blue scales. A complete series of black terminal spots. Orbicular absent. Reniform traceable in all specimens, but varies from a pair of narrow black short lines to a leaden-gray spot, with or without defining black scales at sides. Secondaries dirty white at base, outwardly smoky, fringes whitish. Beneath: primaries yellowish, outwardly smoky and mottled to obscurely reproduce the markings of upper surface; secondaries whitish, with a narrow dusky outer margin and a dusky discal lunule.

Expands .75–.82 inch = 19–21 mm.

Hab.—Southern Arizona, August 15th, Poling; New Mexico, Hot Springs, alt. 7000 feet, August, Hulst; New Mexico, No. 800, Cockerell.

Five male specimens, all in fair or good condition. The species is allied to *gonella* and *flavicollis*, but is smaller and differs from both in having the maculation chocolate-brown instead of blackish or leaden gray. The thorax is not so completely brown and the markings of the primaries are much more fragmentary. It differs further in the complete absence of the orbicular.

Yrias terminalis n. sp.

Similar to *volucris* Grote in maculation and general appearance, but much more contrastingly marked. The ground color is distinctly more yellowish and mottled, without the even bluish shading described by Mr. Grote, and the lines stand out in good contrast, although they are not black as in *repentis*. A rusty brown shade line accompanies the t. a. line outwardly, another crosses the wing just beyond the median line, the s. t. line is partly of the same color, and a well-marked rusty shade borders the s. t. line outwardly. The s. t. space tends to break up into a dark costal, a central and an inner marginal dark blotch, the central blotch extending into the terminal space. Secondaries also more yellowish and with more contrasting lines than in *volucris*.

Expands .95–1.05 inches = 24–26 mm.

Hab.—Yavapai County, Arizona, May 20th to 30th.

Three males and three females from Mr. Hutson, sent in with a lot of *volucris* and *clientis*. From the lot of 40 *volucris* before me, these six specimens stand out distinctly by their mottled appearance, and their is no intergradation. In fact, there is little variation in this genus, the 60 or more *clientis* being almost alike. In *volucris* and *terminalis* the last segment of the abdomen of the female is rusty brown at the tip, and the lateral incisures of the ventral sclerite

are sharply cut. In the male *volucris* the middle tibiæ are outwardly thickened by hairy and scaly vestiture, while in the new species there is little or no surplus vestiture.

Chytolita fulicalis n. sp.

Ground color dull mouse-gray or smoky. Head and thorax concolorous, abdomen hardly lighter. Primaries with the median lines single, only a little darker, slender, continuous. T. a. line a little irregular, as a whole with a very even outcurve. T. p. line also irregular, with a moderate, even outcurve over cell and an almost equal incurve below. S. t. line punctiform, very obscure, the spots interspaceal, parallel with the outer margin. A series of very small, blackish terminal lunules. Reniform black or blackish, moderate in size, sublunate, not definitely outlined. Secondaries hardly paler than the primaries, with a narrow smoky median transverse line. Beneath: primaries smoky, yellowish along costa, with a smoky extra-median line. Secondaries yellowish, powdery, with a dusky extra-median line and a discal spot.

Expands .96 inches = 24 mm.

Hab.—Tennessee, August 1st, S. T. Kemp.

A single male in good condition. This is the smallest of our species and the most obscurely marked, differing at once from both the others by the dark smoky ground which has a dash of reddish.

THE COLEOPTERA OF NEW MEXICO.

BY H. C. FALL AND T. D. A. COCKERELL.

The list of New Mexico Coleoptera was begun in 1893 as a card-catalogue in the Department of Zoology and Entomology at the New Mexico Agricultural College. At that time the principal sources of information were the excellent lists published by Dr. Snow in the Transactions of the Kansas Academy of Sciences, and the records of Professor C. H. T. Townsend, the first entomologist at the New Mexico Agricultural College. There were, in addition, a number of records published at different times by Drs. LeConte, Horn and others, and efforts were made to find and include all of them. Professor H. F. Wickham, of the University of Iowa, hearing of the proposed list, very kindly supplied his numerous manuscript records, mainly from Albuquerque, and in addition identified many species collected in the Mesilla Valley. The first part of the list (Cicindelidæ and Carabidæ) appeared in Bulletin 24 of the New Mexico Agricultural Experiment Station (1897), and the remaining families in Bulletin 28 of the same institution (1898). The list as then presented included about 1170 species and races; since that time it has nearly been doubled. During recent years all the new material has been examined by Mr. Fall, in whose cabinet most of it is, and all the descriptions of new species are by him. Very important contributions have been made by Mr. W. Knaus, as a result of his several summer trips to the Sacramento Mountains; numerous other records are due to Mr. E. A. Schwarz, Mr. H. L. Viereck, Dr. Fenyes, etc., to all of whom detailed credit is given in the list.

New Mexico is a region of more or less isolated mountain ranges, with desert country between. Thus the fauna of the higher levels finds itself cut off from possibilities of migration, and what are practically insular conditions prevail. Indeed the desert is for many types of life more impassible than the sea, since the latter can sometimes be crossed on floating timber. The fauna of no one of these New Mexico ranges is anything like completely known, but we are familiar with species of snails and other organisms, endemic upon them. It is altogether too early to say how far these mountains may be endowed with peculiars type of Coleoptera; because there has not

been enough work done to even establish a strong probability that any given form, known only from a particular range, is restricted to it. An analysis of the distribution of the new species described in the present paper shows that they come from many localities; but it is perhaps significant that so many (14) are exclusively from the Sacramento Mountains. It may be added, that from the results obtained in the close study of plants, molluscs, etc., we may expect that in many instances the insects of different groups of mountains will differ only in slight characters—being in the early stages of modification from the original more widespread types. This comparatively slight divergence will not usually be thought worth recording in nomenclature, according to prevalent methods, and will only be fully revealed by biometrical and kindred studies.

It will be convenient to enumerate the principal localities for Coleoptera in New Mexico in groups, according to the regions and types of country they represent.

Eastern Region (east of the Rio Grande).

(1) Raton district (Colfax County): Raton, Barela Mesa, Chicorico Canon. This is just south of the Colorado line.

(2) Trementina district, east of Las Vegas, on the headwaters of the Canadian River. Collector, Miss Alice Blake.

(3) Santa Rosa district (Leonard Wood County): collector W. Knaus. In this general region also is Las Truchas (collector Miss Clara Gerhardt), which must not be confused with the Truchas Peaks.

(4) Roswell district (Chaves County), on the Pecos River; including Dimmitt Lake and Las Lake. This marks approximately the beginning of the Middle Sonoran in the Pecos Valley.

(5) Carlsbad district (Eddy County), on the Pecos, about 65 miles south of Roswell. Eddy is the former name of Carlsbad.

The collections from all of the above five districts are small, and the most eastern parts of New Mexico, within 50 miles of the Texas line, are unexplored for beetles.

(6) Sierra Blanca and Sacramento Mountain district, in Otero and Lincoln Counties. Includes Eagle Creek, Rio Ruidoso (or Ruidoso Creek), Mescalero, Fresnal Creek, Cloudcroft, Wootens and Highrolls. This is an extensive and isolated mountain region, possessing some remarkable endemic snails, and proba-

bly endemic plants. It is mainly in the Transition Zone, but has large patches of Canadian (cf. Bailey, North American Fauna, No. 25). The Guadalupe range, of which the Coleoptera are unknown, may be regarded as a southern extension of it. The Manzano and Sandia ranges (their Coleoptera unknown) are between it and the Las Vegas–Santa Fé Mountains, but are cut off from both by arid lowlands.

(7) Alamogordo-Tularosa district, including La Luz and Alamo Canon, all in Otero County. This is the Middle Sonoran area near the western base of the Sacramentos.

(8) Organ Mountain district, including Organ, Parker's Well, Fillmore Canon, Soledad Canon, Riley's Ranch = La Cueva, Dripping Springs and San Augustine Ranch. A range of sharp peaks running north and south, to the east of Las Cruces, in Dona Ana County. In general, it may be referred to the Upper Austral (Upper Sonoran) Zone. The San Andreas Mountains are practically continuous with the Organs to the north.

(9) Mesilla Valley distinct, in Dona Ana County, Middle Sonoran Zone. This includes areas on both sides of the Rio Grande, but the Coleoptera all come from the east side. Las Cruces, Mesilla Park and Mesilla are in this district, only a few miles apart.

(10) Rincon district, in Dona Ana County, on the Rio Grande; Middle Sonoran. Here come also Hatch and Colora'o, just across the river.

(11) Engle district, Sierra County, about 36 miles north of Rincon. Collector Miss Nora Newberry.

(12) Albuquerque district, in Bernalillo County. Here, passing up the Rio Grande, we reach the Upper Sonoran, though some Middle Sonoran elements still persist. Elba is on the Santa Fé Railroad a little west of Albuquerque.

(13) Santa Fé district; Transition Zone, including Tesuque (or Tsuque). Santa Fé Canons runs up into the Canadian Zone.

(14) Pecos district, in San Miguel and Santa Fé Counties, on the upper Pecos River. This includes Glorieta, the Old Pecos Pueblo and Rowe. It may also be considered to include Manzanares. It is Upper Sonoran, but bordering on Transition.

(15) Thornton district, in Sandoval County, between Albuquerque and Santa Fé. Collector Dr. Fenyes.

(16) Las Vegas district (San Miguel County), including Romeroville, Wiegand Ranch, San Geronimo, Placita, San Ignacio and Las Valles—the last at a lower altitude. This is Upper Sonoran.

(17) Las Vegas Hot Springs and Gallinas Canon; the Upper Gallinas River, in San Miguel Co., Transition Zone, but not without Upper Sonoran elements.

(18) Watrous, Mora County, about 20 miles northeast of Las Vegas; Upper Sonoran.

(19) Beulah district, in the Las Vegas Range; Canadian Zone. Including Rociada, James Canon, Dailey Canon and Crew's Mesa. Here also may be cited Harvey's Ranch and the Viveash Ranch, though they are some little distance away.

(20) Beatty's Cabin, on the headwaters of the Pecos River, not far from the Truchas Peaks. Collector W. P. Cockerell.

(21) Rio de las Casas, in the Las Vegas Range, north of Beulah; collector Dr. Sturgis.

(22) Top of Las Vegas Range, above Beulah; Hudsonian Zone.

(23) Truchas Peaks, between Mora and Rio Arriba Counties; Arctic Alpine Zone. The specimens were obtained above timber line by W. P. Cockerell (cf. American Naturalist, December, 1903.)

(24) Taos, in Taos County.

(25) Taos Peak, in Western Colfax County.

(26) Embudo district, on the Rio Grande, in Rio Arriba County; Upper Sonoran. This includes Rinconada, and may include Ojo Calienta, which is about ten miles distant, but west of the Rio Grande.

Western Region (west of the Rio Grande).

(27) Tierra Amarilla district, in Rio Arriba County, about 20 miles south of the Colorado line.

(28) San Ildefonso, on the west bank of the Rio Grande, about 18 miles northwest of Santa Fé. (Upper Sonoran.)

(29) Abiquiu, Rio Arriba County, west of Embudo.

(30) Bland, in the Jemez region, Sandoval County. The Jemez Mountains have been very little examined for insects of any kind; there is little doubt that they will yield some very interesting species.

(31) Aztec and the San Juan River, in San Juan County, the northeast corner of the Territory. This is an almost unknown region, doubtless full of treasures. The Canon de Chelle may be listed here ; it is mainly in Arizona.

(32) Fort Wingate district, McKinley County, including Gallup and Coolidge. These places are not very far from the Arizona line. Zuni, also in McKinley County, is about 30 miles to the south.

(33) Vega S. José and Chaves, in Valencia County ; collector Prof. C. H. T. Townsend.

(34) Socorro, Socorro County, on the Rio Grande.

(35) Magdalena Mountains, including Magdalena and Water Canon, west of Socorro.

(36) San Marcial, on the Rio Grande, about 25 miles south of Socorro.

(37) Cliff, on the Upper Gila River, in northern Grant County.

(38) Silver City district, Grant County, including Lone Mountain, Pinos Altos, Fort Bayard and Walnut Creek. This district is remarkable for the infusion of Arizonian types. It is much regretted that southern Grant County has not been explored for insects.

(39) Deming district, Luna County, including Florida. Middle Sonoran.

The names of collectors are abbreviated as follows :

C. = T. D. A. Cockerell.
W. = Professor H. F. Wickham.
K. = W. Knaus.
H. & S. = Hubbard and Schwarz.
S. = Dr. Snow and his associates, from the Univ. of Kans.
T. = Professor C. H. T. Townsend.
S. & B., or B. & S. = Schwarz and Barber.
V. = H. L. Viereck.

The Wheeler Survey Records are on the authority of Mr. Henry Ulke.

The Rocky Mountain region in the United States may be roughly said to include Montana, Wyoming, Colorado and New Mexico. The Coleoptera of Montana and Wyoming have not been catalogued, but a very good list of Colorado species has been published by Prof.

H. F. Wickham (Bull. Lab. Nat. Hist. Univ. Iowa, Vol. V, No. 3, 1902). The Colorado list includes about 2165 species and subspecies; the New Mexico one about 2148. That these lists are far from complete is evident from the fact that much smaller and less varied areas have yielded many more species when thoroughly examined; thus New Jersey has 2845, the District of Columbia 2975; while the British Islands, according to Sharp's list of 1883, had 3243 species, and a considerable number have since been added. Mr. W. Knaus in 1902 made a short trip to the Sacramento Mountains in New Mexico, and added 18 genera and 57 species to the New Mexico list; in 1903 he visited the same region, also stopping at Santa Rosa, and added 8 genera and 25 species and varieties. Last year Miss Grace Eaton obtained about 30 of the more conspicuous species in Ponil Canon, and four were new to the list. It is evident that every fresh collection, for a good many years to come, will contain additions; while the critical study of material already in collections will further swell the list.

On the other hand, it may safely be said that we have enough material to determine the general character of the fauna, and to make intelligent comparisons with other faunæ. No doubt we possess the greater number of the species belonging to well known genera, which are especially serviceable for comparisons, because they have been elaborated in all local catalogues; whereas additions among the obscure groups, such as certain of the Staphylinidæ, are at present nearly useless for comparative faunal studies. The New Mexico list is also fortunate in being mainly based on recent material, examined in the light of modern knowledge, and available for further study whenever the occasion demands it.

Comparing the beetles of New Mexico with those of Colorado, one is struck by the large amount of difference in the lists. Colorado has not, of course, the important and characteristic Middle Sonoran element, but the higher elevations are continuous from north to south, and one would expect a practically identical fauna. Botanical investigations, however, have revealed striking differences in the plants of the northern and southern Rocky Mountains, and a degree of endemicity among those inhabiting the mountain ranges which is quite surprising. The oaks (*Quercus*) are abundant in New Mexico, and have a luxuriant development as far north as Manitou, Colorado, and even beyond. But at Boulder, and north of Denver, gen-

erally, they are totally absent. On the western slope they go further north, and one species just enters Wyoming; but there are none at all in Wyoming, with this exception, and none in Montana. This alone would explain the northward limitations to the distribution of the numerous species of Coleoptera which are attached to the oak, and various similar cases could be cited. It appears probable that the oaks were driven south during the glacial period, and owing to the unsuitability of their seed for being carried great distances, have been unable to recover their lost ground. Under these circumstances, the ample powers of flight of certain of the oak-feeding beetles are of no service for promoting migration northward of the slowly moving line of oaks.

The following figures will serve to illustrate the difference between the Colorado and New Mexico lists:

	Genera			Species		
	Colo.	Both.	N. M.	Colo.	Both.	N. M.
Cicindelidæ	—	3.	—	17.	25.	13.
Carabidæ	7.	42.	15.	159.	143.	72.
Dytiscidæ	2.	10.	5.	40.	20.	19.
Gyrinidæ	—	2.	—	7.	2.	1.
Hydrophilidæ	4.	10.	2.	18.	15.	14.
Silphidæ	4.	8.	1.	25.	15.	2.
Endomychidæ	—	3.	—	1.	3.	—
Cerambycidæ *	14.	34.	16.	55.	59.	52.

It will be noted that New Mexico shows a greater proportion of non-Colorado genera than species; or in other words, the species found in New Mexico but not in Colorado are more likely to be of non-Colorado genera than in the reverse case. This is explained by the fact that the desert fauna in nearly all groups is rich in peculiar genera, but these are represented so far up as New Mexico by comparatively few species. On the other hand, the boreal fauna, so strongly developed in Colorado, is largely characterized by the abundance of species of circumpolar genera.

In Colorado the eastern plains region has been little searched for beetles, and the corresponding region of New Mexico is also poorly known. There is no doubt that the plains will furnish many species additional to the lists, and most of these will doubtless be common to both. The following are characteristic eastern species which are known to reach New Mexico, but have not yet been found in Colorado:

* One species is to be added to the Colorado fauna: *Liopus cinereus* Lec., Boulder (C.).

Scarites subterraneus.	*Tachys xanthopus.*
Clivina bipustulata.	*Pterostichus sayi.*
" *ferrea.*	*Dynastes tityus.*
Aspidoglossa subangulata.	*Anomala undulata.*
Panagæus fasciatus.	*Alindria teres.*

The New Mexico list contains over 135 such species, indicating that the eastern fauna is really crossing the plains to some extent, and not only reaching us by way of the northern mountains. There are strong reasons for believing that a considerable part of this migration is recent, and has been assisted involuntarily by man. This affords, of course, a strong argument in favor of the speedy exploration of western regions, in order that their original fauna may be ascertained before it is unduly contaminated by introduced forms. Fortunately for the naturalist, the desert will not quickly or easily accomodate alien elements,* but it is quite otherwise in more ordinary localities; and as Perkins has shown in the Hawaiian Islands the result may be destruction as well as confusion.

The number of species common to New Mexico and Southern California, but not known from Colorado, is over 160, indicating a wide-spread southwestern fauna; but in general, the species of the Southern California coast region are not those of the Rocky Mountains.

We find over 30 names of New Mexico species listed from the Lower Rio Grande, but not in the Colorado, Southern California or District of Columbia lists. Such are for example:

Cicindela circumpicta.	*Oodes cupræus.*
" *severa.*	*Ischiodontus ferreus.*
Dyschirius terminalis.	*Ludius texanus.*
Philophuga viridicollis.	*Agrilus addendus.*
Helluomorpha ferruginea.	*Mastinocerus texanus.*

The following are examples of characteristic southern genera which reach New Mexico, but do not enter Colorado:

Thalpius.	*Thrincopyge.*	*Aphonides.*	*Derobrachus.*
Hololepta.	*Lycus.*	*Strategus.*	*Tylosis.*
Sandalus.	*Plusiotis.*	*Allorhina.*	*Dendrobias.*

* Unless brought from similar regions. A few years ago some date palms arrived in Washington with about fifty species of the Algerian fauna from snails and slugs to mites, centipedes and coccids. Of course they were suitably treated for the destruction of all these, before being sent to our southwestern country; but a careless importer could have provided us with quite a fauna in this single sending! One species of Coccidæ did get through alive.

Because of the conspicuous place which these southern genera occupy in the fauna, an entomologist arriving from the north or east is very likely to assume that the Middle Sonoran of New Mexico contains precisely the same elements as the Lower Sonoran of Arizona just as it has been assumed that Florida is typically West Indian, because its numerous West Indian genera attract attention, and the *absence* of innumerable West Indian types is not so readily observed.

Since the Lower Sonoran of Arizona has such conspicuous vegetable types not found in the Middle Sonoran—such as the giant cactus, the palo-verde and the crown of-thorns, it is but natural that it should also have its peculiar insects. No list wholly suitable for comparison has been published, but Mr. Schwarz has permitted us to make use of an unpublished list of species taken by Mr. Hubbard and himself at Tucson, Arizona, and from this we give a moderately long list of species not yet reported from New Mexico.

TUCSON, ARIZONA (Hubbard and Schwarz).

Cnemidotus simplex Lec.
Laccophilus americanus Aubé.
Deronectes æquinoctialis Clk.
Hydroporus addendus Crotch.
" *axiliaris* Lec.
Eumicrus vestalis Csy.
Tropisternus sublævis Lec.
Philhydrus fucatus Horn.
" *carinatus* Lec.
Dactylosternum cacti Lec.
Pelosoma capillatum Lec.
Megasternum cerei Sz.
Ptomaphagus fisus Horn.
Clambus gibbulus Lec.
" *puberulus* Lec.
Hamotus elongatus Bndl.
Trimium puncticolle Lec.
Maseochara semivelutina Solsky.
" *opacella* Shp.
" *puberula* Csy.
Apheloglossa rufipennis Csy.
Xanthopygus cacti Horn.
Belonuchus ephippiatus Say.
" *xanthomelas* Solsky.
Actobius ocreatus Horn.
" *elegantulus* Horn.
Xantholinus dimidiatus Lec.
" *pusillus* Sachse.
Stenus zunicus Csy.
" *alacer* Csy.
" *vestalis* Csy.
Cryptobium pimerianum Lec.
Lathrobium lituarium Lec.
Lithocharis tabacina Csy.
Pinophilus densus Lec.
Physetoporus grossulus Lec.
Erchomus inflatus Horn.
" *punctipennis* Lec.
Homalium cerei Sz.
Elensis fasciata Lec.
Orthoperus glaber Lec.
Cryptognatha pusilla Lec.
Scymnus flebilis Horn.
Scymnillus aterrimus Horn.
Ditoma gracilis Shp.
Phlœonemus catenulatus Horn.
Silvanus nitidulus Lec.
" *rectus* Lec.
" *opaculus* Lec.
Hololepta yucateca Mars.
" *cacti* Lec.
" *vicina* Lec.

Paromalus opuntiæ Lec.
" *consors* Lec.
" *gilensis* Lec.
Saprinus pæminosus Lec.
Aeletes basalis Lec.
Colastus truncatus Rand.
Cybocephalus californicus Horn.
Amphicrossus niger Horn.
Limnichus nebulosus Lec.
Bothriophorus minutus Lec.
Dryops productus Lec.
Heterocerus collaris Kiesw.
Horistonotus pullatus Horn.
Esthesopus dispersus Horn.
Cryptohypnus futilis Lec.
Dicrepidius corvinus Cand.
Glyphonyx testaceus Melsh.
Chrysobothris octocola Lec.
Acmæodera delumbis Horn.
Polycesta velasco L. and G.
Mastinocerus opacus Horn.
Collops pulchellus Horn.
Dasytes impressus Gorh.
Ctenobium cinereum Horn.
Amphicerus fortis Lec.
Atænius hirsutus Horn.
Bradycinetelus serratus Lec.
Cotalpa flavida Horn.
Eustromula valida Lec.
Æthecerinus lateciuctus* Horn.
Monilema gigas Lec.
Liopus centralis Lec.
Chlamys tuberculata Kl.
Pachybrachys livens Lec.
Gastroidea cæsia Rog.
Trirhabda geminata Horn.
Bruchus limbatus Horn.
Anthicus lecontei Bates.
" *horridus* Lec.
Macrobasis purpurea Horn.
Dirotognathus sordidus Horn.
Apion ventricosum Lec.
Smicronyx quadrifer Csy.
" *imbricatus* Csy.
Anthonomus pauperculus Lec.
Tychius variegatus Csy.
Acalles porosus Lec.
Trichobaris mucorea Lec.
Cactophagus validus Lec.
Yuccaborus frontalis Lec.
Apotrepus densicollis Coy.

How many of these will yet be found in New Mexico it is of course impossible to say; but they are to be looked for principally to the south and west of Silver City and Deming.

CICINDELIDÆ.

Amblychila cylindriformis Say. Fort Union (Maj. Sibley).

Tetracha carolina L. Mesilla Valley (C.), Grant Co. (Howard), Roswell (C.), Alamogordo (K.).

Cicindela obsoleta Say. Gallinas Canon (S.), Las Vegas (Beach), Grant Co. (Howard).

C. obsoleta v. *vulturina* Lec. Gallinas Canon (S.), Santa Fé (Fenyes).

C. obsoleta v. *prasina* Lec. Gallinas Canon (S.), Las Vegas Hot Springs (C.), Grant Co (Howard).

C. longilabris Say. Santa Fé Canon (S.), Beulah (Skinner), Ponil Canon, 9650 ft. (Miss Grace Eaton).

C. longilabris var. *laurentii* Schaupp. Beulah, 9000 ft. (Beyer), Ponil Canon (Miss Grace Eaton).

C. nigrocærulea Lec. Deming (cf. Leng), Luna (W.), on flats east of Alamogordo, along streams from overflow of irrigation ditches; in numbers, varying from the typical blue-black, through various shades of green to black (K.).

* *Æthecerinus* = *Æthecerus* Chevr., 1862 (not Wesm., 1845).

C. scutellaris Say. var. Socorro (S.).

C. scutellaris v. *unicolor* Dej. Socorro (S.).

C. pulchra Say. Gallinas Canon (S.), Socorro (S.), Grant Co. (Howard), Las Vegas (M. Benedict), Barela Mesa (Anna Gohrman), Santa Fé (Fenyes).

C. hornii Schaupp. Fort Bayard (cf. Horn).

C. pimeriana Lec. "New Mexico" (cf. Leng).

C. purpurea Oliv. Barela Mesa (Anna Gohrman).

C purpurea v. *audubonii* Lec. Gallinas Canon (S.).

C. purpurea v. *cimarrona* Lec. Gallinas Canon (S.), Socorro (S.), Cloudcroft (K.), Beulah (Skinner), Ruidoso (T.), Las Vegas Hot Springs (M. Holzman).

C. venusta Lec. "New Mexico" (cf. Leng).

C. fulgida Say. Albuquerque (W.), alkali flats near Santa Rosa (K.).

C. vulgaris Say. Albuquerque (W.), Gallinas Canon, a variety (S.), Pecos (C.), Santa Fé Canon (S.), Las Vegas (L. Tamme).

C. vulgaris v. *obliquata* Kirby. Coolidge (W.).

C. repanda Dej. Albuquerque (W.).

C. oregona Lec. Beulah (C.), Ruidoso (T.), Sacramento Mts. (K.), Pecos (C.), Santa Fé Canon (S.).

C. oregona v. *maricopa* Leng. "New Mexico" (Nat. Mus. coll.).

C. hirticollis Say. Socorro (S.), San Ildefonso (Wheeler Surv.), Thornton (Fenyes).

C. tenuisignata Lec. Mesilla Park (C.), common east of Alamogordo, with *C. nigrocærulea* (K.).

C. cinctipennis v. *imperfecta* Lec. Gallinas Canon (S.).

C. punctulata Fabr. Gallinas Canon (S.), Socorro (S.), Grant Co. (Howard), Santa Fé Canon (S.), Santa Rosa (K.).

C. punctulata v. *micans* Fab. Albuquerque (W.), Santa Fé (C.), Mesilla Valley (C.), La Trementina (Alice Blake), Beulah (C.), Zuni (T.), Grant Co. (Howard), Gallinas Canon (S.), Socorro (S.), Santa Fé Canon (S.), near Rowe (C.), Santa Rosa (K.).

C. macra Lec. Socorro (S.), Mesilla Valley (T.).

C. sperata Lec. Albuquerque (W.), Deming (Schwarz), Rincon (C.), Mesilla (C.), Santa Rosa (K.), Roswell (C.).

C. lepida Dej. Albuquerque (W.), Mesilla Park, a variety (C.). The Mesilla Park (July 8th, at light) insect, compared with a New Jersey specimen, is a little larger (length about 10½ mm.), with the head noticeably larger and broader, the metallic color of head and thorax coppery-crimson instead of green. The femora are light brownish-yellow, the hind femora without metallic color. The markings of the elytra have a warm red tint (C.).

C. togata v. *apicalis* W. Horn. Alkali flats near Santa Rosa (K.).

C. circumpicta Laf. Roswell (C.), Santa Rosa (K.).

C. prætextata Lec. Albuquerque (W.), Mesilla Valley (C.), Socorro (S.), Tularosa (T.). Taken at light at Mesilla Park, July 8th.

C. severa Lec. "New Mexico" (Townsend, Tr. Tex. Acad., 1903).

C. cartagena Dej. v. *hæmorrhagica* Lec. La Trementina (Alice Blake), in canon between Santa Fé and Thornton (Fenyes).

C. lemniscata Lec. Deming (Schwarz), Mesilla Valley (C.), Roswell (C.), Alamogordo (K.).

C. flavopunctata Chevr. One specimen at Alamogordo (K.).

C. rufiventris v. 16-*punctata* Kl. Albuquerque (W.), Gallinas Canon (S.), Organ Mts. (T.), Sta. Rosa (K.).

CARABIDÆ.

Omophron americanum Dej. Albuquerque (W.), Santa Fé Canon (S.), Walnut Creek (S.).

Cychrus elevatus Fabr. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (Skinner), near Cloudcroft, var. (K.).

C. snowi Lec. Santa Fé Canon (S.).

Carabus tædatus Fabr. Gallinas Canon (S.), Santa Fé Canon (S.), Eagle Creek (T.), Beulah (Skinner).

C. tædatus v. *oregonensis* Lec. Top of Las Vegas Range (C.), near Cloudcroft (K.).

C. serratus Say. Santa Fé Canon (S.), Las Vegas (C.).

Calosoma scrutator Fab. Gallinas Canon (S.), Mesilla Valley (C.), Grant Co. (Howard), Palamos (T.), Las Vegas (Frank Springer).

C. prominens Lec. Albuquerque (W.), Coolidge (W.).

C. peregrinator Guér. Gallinos Canon (S.), Water Canon (S.), Mesilla Valley (C.), Alamogordo (K.), Ruidoso (T.), Grant Co. (Howard).

C. lugubre Lec. Roswell (C.), Cloudcroft (K.).

C. triste Lec. Water Canon (S.).

C. obsoletum Say. Gallinas Canon (S.), Benlah (Skinner), Santa Fé (Fenyes).

C. obsoletum v. *microsticta* Casey. Ft. Wingate (Col. Not. vii).

C. calidum v. *laticollis* Casey. Las Vegas (Col. Not. vii).

Notiophilus semistriatus Say. "N. Mex." (S.).

N. aquaticus Linn. (= *hardyi* Putz). Beulah (C.). Top of Las Vegas Range (C).

N. novemstriatus Lec. Cloudcroft (V.).

Nebria purpurata Lec. West fork of Rio de las Casas (Sturgis).

N. obliqua Lec. Santa Fé Canon (S.), Gallinas Canon (S.).

N. hudsonica Lec. Walnut Creek (S.), Beulah (C.).

N. sahlbergi Fisch. Gallinas Canon (S.). Top of Las Vegas Range (C.), West fork of Rio de las Casas (Sturgis).

Pasimachus duplicatus Lec. Cloudcroft (K.).

P. duplicatus v. *costifer* Lec. Water Canon (S.), Coolidge (W.), Cloudcroft (K.).

P. obsoletus Lec. Grant Co. (Howard), La Trementina (Alice Blake).

P. elongatus Lec. Gallinas Canon (S.), Santa Fé (C.), Santa Fé Canon (S.), Las Vegas (C.).

P. californicus Chd. Cloudcroft (K., C.).

Scarites subterraneus Fabr. Albuquerque (W.), Mesilla (Mrs. Herron).

Dyschirius globulosus Say. Albuquerque (W.), Santa Fé Canon (S.), Sacramento Mts., identity a little doubtful (K.).

D. terminatus Lec. Albuquerque (W.).

D. sphæricollis Say. Albuquerque (W.).

D. salivagans Lec. Albuquerque (W.).

D montanus Lec. "N. Mex."

Clivina ferrea Lec. Mesilla (C.).

C. bipustulata Fabr. Mesilla (C.).

Aspidoglossa subangulata Chd. "New Mexico."

Schizogenius depressus Lec. Walnut Creek (S.), Colora'o (C.), Pecos (C.).

Panagæus fasciatus Say. Romeroville (W. P. C.).

Micrixys distinctus Hald. Near Santa Fé (Richard Kern, fide Le Conte). This is the type locality.

Bembidium coxendix Say. Albuquerque (W.), Thornton (Fenyes).

B. bifossulatum Lec. Near Luna (W.).

B. longulum Lec. Pecos (C.).

B. planiusculum Mann. "New Mexico" (Bolter coll.).

B. incertum Mots. Top of Las Vegas Range (C.).

B. nebraskense Lec. West fork of Rio de las Casas, identity doubtful (Sturgis).

B. transversale Dej. Gallinas Canon (S.), Santa Fé Canon (S.), Santa Fé (C.), Taos (Wheeler Survey).

B. transversale v. *lugubre* Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Ruidoso, identity doubtful (T.), Sacramento Mts. (K.).

B. striola Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Sacramento Mts. (K.).

B. bimaculatum Kirby. Santa Fé Canon (S.), Harvey's Ranch (Ruth Raynolds).

B lucidum Lec. Sacramento Mts. (K.), Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Beulah (C.), Placita (C.), Las Vegas Hot Springs (C.), Harvey's Ranch (Ruth Raynolds), Las Valles (C.), San Geronimo (W. P. C. and M. Cooper), Silver City (C.), Thornton (Fenyes). A species more especially characteristic of the Transition and Canadian Zones, but Viereck took it at Alamogordo, which is Middle Sonoran.

B. fuscicrum Mots. "New Mexico" (cf. Leng and Beutenmüller). We have it from Florrissant, Colorado, prox. 8000 ft.

B. picipes Kirby. Santa Fé Canon (S.).

B. subangustatum Haywd. Alamogordo (V.).

B. grapii Gyll. Gallinas Canon (S.), top of Las Vegas Range, 11,000 ft. (C.), Harvey's Ranch (Ruth Raynolds).

B. nubiculosum Chaud. Mesilla (C.), Albuquerque (C., W.).

B. intermedium Kirby. Santa Fé Canon (S.), Luna (W.), Santa Rosa (K.), Pecos (C.), San Ildefonso (Wheeler Survey).

B. versicolor Lec. Albuquerque (W.), Sacramento Mts. (K.), Highrolls (V.).

B. pictum Lec. Las Vegas (C.), Cloudcroft (K.). It is probable that most, if not all, of the specimens above referred to *versicolor*, are really this species.

B. constrictum Lec. "New Mexico" (Hayward).

B. constricticolle Hayw. San Juan R. (fide Hayward).

B. dubitans Lec. Coolidge (W.), Sacrament Mts. (K.).

B. mutatum G. and H. Beulah (Skinner).

B. quadrimaculatum L. Santa Fé Canon (S.), Las Vegas (C.), Beulah (C.).

B. cautum Lec. Pecos (C.).

B connivens Lec. Santa Fé Canon (S.). I do not think this species is separable from the preceding.

B. assimile Gyll. Santa Fé Canon (S.).

Tachys nanus Gyll. Beulah (Skinner), Gallinas Canon (S.), Santa Fé Canon (S.), Truchas Peaks (W. P. C.).

T. incurvus Say. Albuquerque (W.), Santa Fè Canon (S.).

T. dolosus Lec. Albuquerque (C.).

T. cockerelli n. sp. Romeroville (C.).

T. audax Lec. Las Vegas (C.).

T. nebulosus Chaud. Santa Fé (Fenyes), Highrolls (V.).

T. xanthopus Dej. "New Mexico" (fide Hayward).

T. corax Lec. Albuquerque (C.).

T. vorax Lec. "New Mexico" (fide Hayward).

T. pumilus Dej. Sacramento Mts. (K.).

Patrobus longicornis Say. Sacramento Mts. (K.).

Trechus chalybeus Mann. Santa Fé Canon (S.), Walnut Creek (S).

Pterostichus protractus Lec. Santa Fé Canon (S.).

P. longulus Lec. Santa Fé Canon (S.), Gallinas Canon (S.), Beulah (Skinner), Fort Wingate (Wheeler Surv.), S. Ildefonso (Wheeler Surv.).

P. substriatus Lec. Beulah (Skinner), Albuquerque (W.), Santa Fe (C.). Coolidge (W.), Sacramento Mts. (K.), Mescalero (C.), Watrous (C.), Eagle Creek (T.), Cloudcroft (V.).

P. constrictus Say. Walnut Creek (S.).

P. scitulus Lec. Mesilla Valley (C.), Zuni (T.), Colora'o (C.).

P. lætulus Lec. Coolidge (W.), Mesilla Valley (C.).

P. sayi Brullé. Albuquerque (W.), Mesilla Valley (C.).

P. lucublandus Say. Las Vegas (C.).

P. luczotii Dej. Gallinas Canon (S.), Santa Fé Canon (S.), top of Las Vegas Range (C.), Cloudcroft (C.), Sacramento Mts. (K.), Beulah (C.), Rio de las Casas (Sturgis). A species characteristic of the Canadian and Hudsonian Zones.

P. femoralis Kirby. Beulah (C.).

Evarthrus torvus Lec. Gallinas Canon (S.), Las Vegas (C.), Sacramento Mts. (K.).

Amara jacobinæ Lec. Deming (Schwarz), Beulah (Skinner).

A. laticollis Lec. Sacramento Mts. (K.), Santa Fé (C.), Viveash Ranch (C.).

A. carinata Lec. Albuquerque (W.), Santa Fé (C.), Coolidge (W.), Las Vegas (Gilbert Rosenwald).

A. brunneipennis Dej. Top of Las Vegas Range (C.), Truchas Peaks (W. P. C.). A species of the Hudsonian and Arctic-Alpine Zones.

A. fulvipes Putz. "New Mexico" (Bolter coll.).

A. latior Kirby. Santa Fe Canon (S.), Coolidge (W.).

A. impuncticollis Say. Old Pecos Pueblo (E. L. Hewett and Ruth Raynolds).

A. fallax Lec. Walnut Creek (S.).

A. confusa Lec. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Coolidge (W.), between Santa Fé and Ft. Wingate (Wheeler Surv.).

A. polita Lec. Coolidge (W.), San Geronimo (W. P. C. and M. Cooper), Beulah (Skinner), Santa Fè (Fenyes).

A. farcta Lec. "New Mexico."

A. interstitialis Dej. Gallinas Canon (S.), Beulah (C.), Sacramento Mts. (K.), Las Vegas (C.).

A. erratica Sturm. Gallinas Canon (S.), Santa Fé Canon (S.).

A. californica Dej. Las Cruces (C.).

A. remotestriata Dej. Gallinas Canon (S.), Santa Fé Canon (S.), top of Las Vegas Range (C.), Cloudcroft (K.), Harvey's Ranch (Ruth Raynolds), Las Vegas (Martin D. C.), Las Vegas Hot Springs (C.), Coolidge (W.).

A. femoralis Horn. Truchas Peaks (W. P. C.). This is from the Arctic-Alpine Zone.

A. gibba Lec. Las Vegas (M. Cavanaugh).

A. nupera Horn. Las Vegas (C.), Las Valles (C.), San Geronimo (W. P. C. and M. Cooper), Sacramento Mts. (K.), Highrolls (V.).

A. harpalina Lec. Water Canon (S.).

A. musculus Say. "New Mexico" (Fenyes).

Diplochila obtusa Lec. Ruidoso (T.).

Dicælus lævipennis Lec. Las Vegas (Gilbert Rosenwald), Eagle Creek (T.), Sacramento Mts. (K.), Cloudcroft (V.).

D. sculptilis Say. Beulah (C.), Sacramento Mts. (K).

Calathus gregarius Say. Ruidoso, identity doubtful (T.), Santa Fé (Fenyes).

C. ingratus Dej. Santa Fé Canon (S.).

C. advenus Lec. Walnut Creek (S.).

C. dubius Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Eagle Creek (T.), Sacramento Mts. (K.), Pecos (C.).

Platynus myrmecodes Horn. Las Vegas (C.), Rio Ruidoso (T.).

P. dissectus Lec. Cloudcroft (K.), Raton (W. P. C.), Eagle Creek (T.), Santa Fé (Fenyes).

P. nivalis Horn. Beulah (C., Skinner), Pecos (C.), Water Canon (S.), Santa Fé Canon (S.).

P. sinuatus Dej. Santa Fé Canon, var. (S.), Pecos (C.), Rio de las Casas (Sturgis).

P. extensicollis Say. Albuquerque (W.), Gallinas Canon (S.), Las Vegas (C.).

P. extensicollis v. *simplex* Lec. Mesilla (C.).

P. decorus Say. Albuquerque (W.), Mesilla Valley (C.).

P. californicus v. *texanus* Lec. Albuquerque (W.), Colora'o (C.).

P. bicolor Lec. Walnut Creek (S.).

P. piceolus Lec. Beatty's Cabin, identity doubtful (W. P. C.).

P. affinis Kirby. Taos (Wheeler Surv.).

P. frater Lec. Coolidge (W.).

P. cupripennis Say. Santa Fé Canon (S.), Beulah (W. P. C.).

P. placidus Say. Beulah (Skinner). Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Mesilla Valley (C.), Sacramento Mts. (K.), Santa Fé (C.), Las Vegas (C.).

P. bogemanni Gyll. Cloudcroft (V.).

P. quadripunctatus DeG. Gallinas Canon (S.).

P. bembidioides Kirby. Gallinas Canon (S.).

P. ruficornis Lec. Las Vegas (C.), var. ? Highrolls (V.).

Euphorticus pubescens Dej. Walnut Creek (S.).

Casnonia pennsylvanica L. Las Truchas, Guadalupe Co. (L. Gerhardt).

Galerita lecontei Dej. Mesilla Valley (C.).

Zuphium americanum Dej. Alamogordo (K.).

Diaphorus tenuicollis Lec. Mesilla Valley (C.).

Thalpius hornii Chd. Mesilla Valley (C.).

Lebia divisa Lec. Beulah (C.).

L. grandis Hentz. Deming (Schwarz).

L. atriventris Say. Albuquerque (W.).

L. majuscula Chd. Gallinas Canon (S.), Mesilla Valley, on *Isocoma* (C.), Organ (C.), Tsuque (Fenyes).

L. atriceps Lec. Colora'o (C.).

L. viridis Say. Gallinas Canon (S.), Santa Fé (C.), Eagle Creek (T.), Beulah (Skinner), Soledad Canon, Organ Mts., on *Fallugia*, var. (C.), Thornton (Fenyes), Highrolls (V.).

L. pleuritica Lec. Organ Mts. (T.).

L. scapula Horn. Walnut Creek (S.).

L. analis Dej. Walnut Creek, var. (S.).

L. scapularis Dej. Gallinas Canon (S.).

L. furcata Lec. Probably this was recorded from Gallinas Canon (S.) as "*fuscata* Lec." Albuquerque (W.), Gallup (W.).

L. guttula Lec. Coolidge (W.), Alamogordo (V.).

L. bivittata Fabr. Gallinas Canon (S.), Mesilla (C.), Organ Mts. (C.), Santa Fé (Fenyes). Found on *Solanum*.

Apristus subsulcatus Dej. Las Vegas Hot Springs (C.).

Metabletus americanus Dej. Santa Fé Canon (S.), Albuquerque (W.), Beulah (C.).

Axinopalpus biplagiatus Dej. Mesilla (C.).

Tecnophilus croceicollis Mén. Mesilla, June 21 (C.), Albuquerque (W.), Coolidge (W.), Colora'o, identification doubtful (C.).

Callida platynoides Horn. Walnut Creek (S.).

Philophuga viridicollis Lec. Gallinas Canon (S.), Highrolls (V.).

Pinacodera punctigera Lec. Walnut Creek (S.), Dripping Spring (C.), Romeroville (C.), Cloudcroft (K.).

Cymindis laticollis Say. Gallinas Canon (S.), Albuquerque (W.), Santa Fé Canon (S.), Coolidge (W.), Las Vegas (M. Cavanaugh), Ruidoso (T.), La Trementina (Alice Blake).

C. cribricollis Dej. Gallinas Canon (S.), Santa Fé Canon (S.), Las Vegas (C.), Cloudcroft (K.), Beulah (Skinner). While the ranges of this and the last overlap, the present species seems to belong to higher altitudes than *C. laticollis*.

C. planipennis Lec. "New Mexico" (Ulke), Santa Fé (Fall).

Helluomorpha ferruginea Lec. Tularosa (T.).

Brachynus cinctipennis Chevr. Albuquerque (W.).

B. conformis Dej. Albuquerque (W.).

B. tschernikhii Mann. Walnut Creek (S.).

Chlænius ruficaudus Chaud. Walnut Creek (S.).

C. sericeus Forst. Top of Las Vegas Range (C.), Las Vegas (Gilbert Rosenwald), Pecos, identity doubtful (C.).

C. leucoscelis Chevr. Las Vegas Hot Springs (C.).

C. solitarius Say. "New Mexico" (Wheeler Surv.), Albuquerque (W.), Thornton (Fenyes).

C. obsoletus Lec. Walnut Creek (S.).

C. tricolor Dej. Albuquerque (W.).

C. brevilabris Lec. Albuquerque (C.).

C. pennsylvanicus Say. Albuquerque (W.), Las Vegas (Gilbert Rosenwald).

Oodes cupræus Chaud. Albuquerque (C., W.).

Geopinus incrassatus Dej. Gallup (Helen Blake).

Nothopus zabroides Lec. Albuquerque (W.), Coolidge (W.). Mesilla Park (C.), Cloudcroft (K.), near Abiquiu (Wheeler Survey).

Polpochila capitata Chaud. Deming (Schwarz).

Cratacanthus dubius Beauv. Coolidge (W.).

Piosoma setosum Lec. Water Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Gallup (W.), Old Pecos Pueblo (Hewett and Raynolds, C.).

Agonoderus lineola Fabr. Albuquerque (W.), Mesilla Valley (C.), Colora'o (C.).

A. pallipes Fabr. Albuquerque (W.), Santa Fé (C.), Silver City (C.), Pecos (C.), Las Vegas (Gilbert Rosenwald), Deming (Schwarz), Mesilla (C.).

Discoderus parallelus Hald. Top of Las Vegas Range (C.).

D. impotens Lec. Albuquerque (W.), Mesilla Valley (C.), Alamogordo (K.), Roswell (C.), Colora'o (C.), Silver City (C.), Deming (C.), Thornton (Fenyes).

D. tenebrosus Lec. Santa Fé (Fenyes).

D. cordicollis Horn. Deming (Schwarz).

D. amœnus Lec. Alamogordo (V.).

Harpalus retractus Lec. Pecos (C.), Santa Fé (C.), Albuquerque (W.), Gallinas Canon (S.), Ruidoso (T.), Beulah (Skinner), Sacramento Mts. (K.), Watrous (C.), Coolidge (W.), Santa Fé Canon (S.), Las Vegas (C.), Pinos Altos (C.). Abundant from the Canadian Zone to the Upper Sonoran, but not observed in the typical Middle Sonoran.

H. amputatus Say. Sacramento Mts. (K.), Santa Fè (C.), Santa Fé Canon (S.), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Gallup (Helen Blake), Las Valles (C.), Coolidge (W.), Las Vegas (C.), Glorieta (C.).

H. caliginosus Fabr. Albuquerque (W.), Gallinas Canon (S.), Gallup (W.), Grant Co. (Howard), Las Vegas (C.), Roswell (C.). A species of the Upper Sonoran, entering the Transition Zone.

H. pennsylvanicus DeG. Albuquerque (W.), Mesilla (C.), Roswell (C.), Santa Fé (Fenyes).

H. compar Lec. Santa Fé Canon (S.).

H. fallax Lec. Gallinas Canon (S.), Beulah (Skinner). The types were collected at Santa Fé by Kern and Fendler.

H. herbivagus Say. Gallinas Canon (S.), Santa Fé Canon (S.), San Geronimo (W. P. C. and M. Cooper).

H. somnulentus Dej. Beulah (Skinner).

H. ellipsis Lec. Santa Fé Canon (S.), Beulah (Skinner).

H. montanus Lec. Gallinas Canon (S.), Santa Fé Canon (S.).

H. funestus Lec. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Taos (Yarrow), Beulah (Skinner).

H. oblitus Lec. Albuquerque (W.), Water Canon (S.), Santa Fé (C.), Coolidge (W.), Pecos (C.). The type was collected at Santa Fé by Fendler.

H. clandestinus Lec. Las Vegas (C.), Sacramento Mts. (K.), Santa Fé (Fenyes).

H. ochropus Kirby. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Lone Mountain (C.), Taos (Yarrow). *H. desertus* Lec. was founded on a specimen collected by Fendler.

H. lustrans Casey. Santa Fé (C.), Albuquerque (W.), Coolidge (W.).

H. basilaris Kirby. Water Canon (S.).

H. alienus Lec. Santa Fé (Fenyes).

H. cordatus Lec. Santa Fé (Fenyes).

Selenophorus pedicularius Dej. Gallinas Canon (S.), Albuquerque (W.), Coolidge (W.), Santa Fé Canon (S.), Organ Mts. (T.), Las Vegas (C.).

Stenolophus conjunctus Say. Santa Fe Canon (S.), Coolidge (W.), San Geronimo (W. P. C. and M. Cooper), Beulah (C.).

S. cincticollis Lec. Roswell (C.).

S. ochropezus Say. Albuquerque (W.), Mesilla Valley (C.).

Bradycellus (Trichocellus) cognatus Gyll. Sacramento Mts. (K.).

B. rupestris Say. Las Vegas (Martin D. C.), San Geronimo (W. P. C. and M. Cooper), Las Valles (C.), Las Vegas Hot Springs (C.), Alamogordo (K.), Santa Fé (Fenyes).

B. rupestris v. congener Lec. Mesilla Valley (C.).

B. nigriceps Lec. "New Mexico" (Fenyes).

Tachycellus nigrinus Dej. Santa Fé Canon (S.), Beulah (C.).

T. turbatus Fall. Common in canons surrounding Cloudcroft (K.), Beulah (C.), Cloudcroft (V.).

Anisodactylus rusticus Dej. "New Mexico." Hook Mountain (collector unknown).

A. harrisii Lec. Sacramento Mts. (K.), Las Vegas, identity doubtful (C.).

A. porosus Mots. "New Mexico." Santa Fè (Feldler), type locality of *A. chalceus* Lec., now considered identical with *porosus*.

A. maculicornis Chaud. Walnut Creek (S.).

Pseudomorpha angustata Horn. Deming (Schwarz).

AMPHIZOIDÆ.

Amphizoa lecontei Matth. Santa Fé Canon (S.).

HALIPLIDÆ.

Haliplus triopsis Say. Albuquerque (W.), Wootens (K.).

Cnemidotus callosus Lec. Albuquerque (W.).

DYTISCIDÆ.

Laccophilus maculosus "Say." San Ildefonso (Wheeler Surv.).

L. decipiens Lec. Albuquerque (W.), Gallinas Canon (S.), Santa Fé Canon (S.), Las Vegas (C.), Canon de Chelle (Wheeler Surv.).

L. proximus Say. Santa Fé Canon (S.).

L. terminalis Sharp. Las Vegas (C.).

L. mexicanus Aubé. Albuquerque (W.).

L. quadrilineatus Horn. Deming (Schwarz).

Bidessus affinis Say. Albuquerque (W.).

Coelambus punctatus Say. Albuquerque (W.).

C. medialis Lec. Albuquerque (W.).

C. nubilus Lec. Albuquerque (W.), Mesilla Valley (C.), Fresnal Creek (K.), Gallinas Canon (S.), Santa Fé Canon (S.). The Albuquerque insect was, at least in part, *femoratus*.

C. femoratus Fall. Albuquerque (W.).

Deronectes griseostriatus DeG. San Geronimo (W. P. C. and M. Cooper).

D. striatellus Lec. Gallinas Canon (S.), Water Canon (S.), Sta. Fé Canon (S.).

Hydroporus obesus Lec. Santa Fé Canon (S.).

H. vilis Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Pecos (C.), Santa Fé, identity doubtful (C.).

H. belfragei Sharp. Beulah (C.).

Ilybius biguttalus Germ. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.).

I. laramæus Lec. Gallinas Canon (S.).

Ilybiosoma regularis Lec. Gallinas Canon (S.).

Copelatus chevrolatii Aubé. Albuquerque (W.).

Agabus cordatus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Ruidoso (T.), Sacramento Mts. (K.), Pecos (C.). The type was obtained at Santa Fé by Fendler.

A. intersectus Cr. Santa Fé Canon (S.).

A. lugens Lec. Santa Fé Canon (S.), Sacramento Mts. (K.), Pecos (C.).

A. semivittatus Lec. Las Vegas (C.).

A. semipunctatus Kirby. Santa Fé Canon (S.). Probably an erroneous determination.

A. disintegratus Cr. Albuquerque (C.).

A. austinii Sharp. Santa Fé Canon (S.).

A. obliteratus Lec. Santa Fé (C.).

A. tristis Aubé. Santa Fé Canon (S.).

Rhantus binotatus Harris. Gallinas Canon (S.), Santa Fé Canon (S.), Albuquerque (C.), Las Vegas (C.), Canon de Chelle (Wheeler Surv.).

R. atricolor Aubé. Walnut Creek (S.), Soledad Canon, Organ Mts. (T.).

Colymbetes sculptilis Harris. "New Mexico" (Wheeler Surv.).

Eretes sticticus L. "New Mexico" (Townsend).

Dytiscus marginicollis Lec. Tierra Amarilla (Wheeler Surv.).

Thermonectes ornaticollis Aubé. Santa Rosa (K.).

T. ornaticollis v. *nigrofasciatus* Aubé. Albuquerque (W.).

T. basilaris Harris. Albuquerque (W.).

Cybister fimbriolatus Say. Albuquerque (W.).

GYRINIDÆ.

Gyrinus plicifer Lec. Albuquerque (W.), Soledad Canon, Organ Mts. (C.).

G. maculiventris Lec. Albuquerque (W.).

Dineutes assimilis Aubé. Albuquerque (W.).

HYDROPHILIDÆ.

Helophorus lineatus Say. Albuquerque (W.).

H. auricollis Esch. Albuquerque (W.).

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Helophorus lineatus Say. Albuquerque (W.).

H. auricollis Esch. Albuquerque (W.).

Ochthebius foveicollis Lec. Moqui Villages (cf. Horn).

O. lineatus Lec. "New Mexico" (cf. Horn).

O. sculptus Lec. Albuquerque (W.).

Hydræna punctata Lec. Beulah (Skinner).

Hydrophilus triangularis Say. Albuquerque (W.), Gallinas Canon (S.), Mesilla Valley (T.), Las Vegas (C.), Alamogordo (K.), La Trementina (Alice Blake).

Tropisternus limbalis Lec. Albuquerque (W.).

T. lateralis Fab. Albuquerque (W.), Gallinas Canon (S.), Santa Fé Canon (S.), Las Vegas (C.).

T. glaber Hbst. Santa Fé Canon (S.), Canon de Chelle (Wheeler Survey), between Santa Fé and Ft. Wingate (Wheeler Survey).

T. californicus Lec. Water Canon (S.), Santa Fé Canon (S.), Las Vegas (C).

T. ellipticus Lec. Albuquerque (W.), Water Canon (S.), Santa Fé Canon (S.), Organ Mts. (T.), Las Vegas (C.), near Abiquin (Wheeler Surv.).

Berosus subsignatus Lec. Albuquerque (W.).

B. infuscatus Lec. Gallinas Canon (S.), Albuquerque (W.), Roswell (C.), Mesilla Park (C.), Alamogordo (K.).

B. striatus Say. Mesilla Valley (C.), Colora'o (C.).

Chætarthria nigrella Lec. Albuquerque (W.), Santa Fé (Fenyes).

C. pallida Lec. Albuquerque (W.).

Limnebius piceus Horn. Gallinas Canon (S.).

Laccobius agilis Rand. Albuquerque (W.), Coolidge (W.), Beulah (C.), Santa Fé (Fenyes).

L. ellipticus Lec. Santa Fé Canon (S.).

Philhydrus nebulosus Say. Santa Fé Canon (S.), Albuquerque (W.), Santa Rosa (K.), Las Vegas Hot Springs (C.).

P. diffusus Lec. Gallinas Canon (S.), Santa Fé Canon (S), Albuquerque (W.).

Cymbiodyta morata Horn. Near the Moqui Villages (cf. Horn), James Canon, near Cloudcroft (K.), Santa Fé (Fenyes), Alamogordo (V.).

C. fimbriata Mels. Santa Fé Canon (S.).

Hydrobius fuscipes L. Santa Fé Canon (S.).

H. scabrosus Horn. Santa Fé Canon (S.), Beulah (Skinner).

Creniphilus subcupreus Say. Santa Fé Canon (S.), Albuquerque (W.), Coolidge (W.), Las Vegas (C.).

C. rufiventris Horn. Gallinas Canon (S.).

C. infuscatus Mots. Gallinas Canon (S.), Santa Fé Canon (S.).

Cercyon melanocephalum L. (?). Santa Fé (Fenyes).

SILPHIDÆ.

Necrophorus carolinus L. Albuquerque (W.).

N. marginatus Fab. Gallinas Canon (S.), Water Canon (S.), Albuquerque (W.), Coolidge (W.), Santa Fé Canon (S.), Cloudcroft (V.). A form exactly intermediate between *marginatus* and *obscurus* was found at Las Vegas (C.).

N. guttula Mots. Apache Spring (T.), Cloudcroft (K.), Aztec (Baker).

N. guttula var. *hecate* Bland. Gallinas Canon (S.), Santa Fé Canon (S.), Santa Fé (Fenyes).

N. pustulatus var. *melsheimeri* Kirby. Beulah (C.), Ponil Canon, 9650 ft. (Miss Grace Eaton).

Silpha truncata Say. Gallinas Canon (S.), Santa Fé Canon (S.), Ruidoso (T.), Pescao (Wheeler Survey).

S. lapponica Hbst. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Santa Fé (C.), Cloudcroft (K.), near Abiquin (Wheeler Surv.).

S. ramosa Say. Albuquerque (W.), Sta. Fé (C.), Las Vegas (C.), Coolidge (W.).

Pteroloma tenuicorne Lec. Ruidoso (T.).

Chaleva basillaris Say. Walnut Creek (S.), Beulah (C.).

C clavicornis Lec. Las Vegas Hot Springs (B. and S.).

Hydnobius substriatus Lec. Beulah (C.), Santa Fé (Fenyes), Wootens (K.), Mt. Park, 6000 ft. below Cloudcroft (K.).

Anisotoma valida Horn. Gallinas Canon (S.).

A. punctatostriata Kirby. Beulah (Skinner).

A. difficilis Horn. Pecos (C.).

A. obsoleta Mels. Las Vegas Hot Springs (B. and S.).

Colenis impunctata Lec. Las Vegas Hot Springs (B and S.).

Liodes globosa Lec. Walnut Creek (S.).

Agathidium revolvens Lec. Sacramento Mts. (K.).

SCYDMÆNIDÆ.

Scydmænus californicus Mots. Cloudcroft (K.).

PSELAPHIDÆ.

Tyrus corticinus Casey. Beulah (Skinner).

Fustiger knausii Schaef. Cloudcroft (K.), Beulah, with *Lasius* (C.).

Decarthron discolor Brend. Albuquerque (W.), see also Casey, Col. Not., vii, p. 585.

Batrisus sp. A single female specimen, Beulah (C.).

Bryaxis texana Casey. Albuquerque, identity not certain (C.).

Euplectus sp. Cloudcroft, under pine bark (K.).

STAPHYLINIDÆ.

Chitalia intricata Casey. Las Vegas Hot Springs (B. and S.).

Lorinota caviceps Casey. Las Vegas Hot Springs (B. and S.).

L. acomana Casey. Cloudcroft (K.). Knaus found two or three under bark in 1902.

Falagria dissecta Er. Beulah (C).

F. subsimilis Casey. Las Vegas (cf. Casey), Las Vegas Hot Springs (B. and S.).

F. bilobata Say. Cloudcroft, identity doubtful (K.).

Atheta sp. Cloudcroft (K.).

Lomechusa (Xenodusa) caseyi Wasm. Las Valles (W. P. C.).

Tachyusa nigrella Lec. Santa Fé Canon (S.). [Identity certainly doubtful.]

T. sp. Las Vegas Hot Springs (B. and S.).

Aleochara bimaculata Grav. Gallinas Canon (S.), Santa Fé Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Coolidge (W.), Cloudcroft (K.).

A. bipustulata L. (*nitida* Grav.), Gallinas Canon (S.).

A. (Baryodma) acomana Casey. Santa Fé Canon (S.) (cf. Casey).

A. (Baryodma) densiventris Casey. Las Vegas (Casey).

A. (Baryodma) recta Casey. Las Vegas (Casey).

Dasyglossa sp. Pecos (C.).

Apteronius schmitti Wasm. Near Las Vegas, with ants (W. P. C. and Mary Cooper), Las Vegas Hot Springs (Barber).

Dinardilla liometopi Wasm. Near Las Vegas, with ants (Mary Cooper), Las Vegas Hot Springs (B. and S.).

Heterothops fumigatus Lec. Santa Fé Canon (S.).

H. mediocris n. sp. Las Vegas Hot Springs (B. and S.).

Quedius explanatus Lec. Santa Fé Canon (S.), Cloudcroft (K.).

Q. fulgidus Fab. Albuquerque (C.), Cloudcroft (K.).

Q. desertus Horn var. Cloudcroft (V.).

Q. limbifer Horn. Cloudcroft (K.).

Q. lævigatus Gyll. Cloudcroft (K).

Q. molochinus Grav. Gallinas Canon (S.), Beulah (C.).

Q. hyperboreus Er. Gallinas Canon (S.).

Q. ænescens Mäkl. Cloudcroft (K.).

Creophilus villosus Grav. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Mesilla Valley (C.), Albuquerque (C.), Ruidoso (T.), Gallup (Helen Blake), Magdalena (A. B. Fitch).

Staphylinus mysticus Er. Walnut Creek (S.), Santa Fé (C.).

S. tomentosus Grav. Pinos Altos (C.).

S. fossator Grav. Santa Fé Canon (S.), Santa Fé var. (C.).

S. modestus n. sp. Fresnal Canon near Cloudcroft (K.), Las Vegas (C.), Santa Fé (Fenyes).

S. comes Lec. Walnut Creek (S.).

S. cinnamopterus Grav. Gallinas Canon (S.).

Belonuchus formosus Grav. Ruidoso (T.).

Tympanophorus puncticollis Er. Cloudcroft (K.).

Philonthus æneus Rossi. Las Vegas (Gilbert Rosenwald).

P. furvus Nord. Gallinas Canon (S.), Santa Fé Canon (S.), Las Valles (C.), Cloudcroft (K., V.), Alamogordo (V.).

P. semiruber Horn. Albuquerque (W.), Coolidge (W.), Mesilla Valley (C.).

P. hepaticus Er. Las Vegas (C), Las Vegas Hot Springs (B. and S.), Alamogordo (V.), Cloudcroft (K).

P. incertus Solsky. Near Las Vegas (C.).

P. flavolimbatus Er. Albuquerque (W.), Mesilla Valley (C.), Coolidge (W.), Gallup (W.), Santa Fé (Fenyes), Cloudcroft (K.).

P. debilis Grav. Santa Fé Canon (S.).

P. varians Payk A. lbuquerque (W.), Coolidge (W.), Mesilla (C.), Mescalero (C.).

P. longicornis Steph. Santa Fé Canon (S.), Thornton (Fenyes).

P. alumnus Er. Mesilla (C), Thornton (Fenyes), Cloudcroft (K.).

P. innocuus Horn. Coolidge (W.), Deming (Schwarz).

P. triangulum Horn. Santa Fé Canon (S.).

P. sordidus Fauvel. Water Canon (S.), Pecos (C.).

P. nigritulus Grav. Gallinas Canon (S.), Pecos (C.).

P. instabilis Horn. Las Vegas (C.), Manzanares Valley (Mary Cooper).

P. quadrulus Horn. Walnut Creek (S.).

Actobius senilis Horn. Pecos (C.).

A. gratus Lec. Albuquerque (W.).

A. pæderoides Lec. Albuquerque (W.), Mesilla Valley (C.), Thornton (Fenyes).

Xantholinus cephalus Say. Cloudcroft (K., V.), Beulah (Skinner).

X. (Nudobius) arizonicus Casey. Las Vegas (cf. Casey). [Probably identical with the preceding.]

X. obsidianus Mels. Las Vegas (C.).

X. hamatus Say. "New Mexico" (cf. Casey, as *Gyrohypnus*).

X. (Gyrophypnus) fragilis Csy. "New Mexico" (cf. Casey).

Dianous nitidulus Lec. Santa Fé Canon (S.), Beulah (C.), Pecos (C.).

Stenus renifer Lec. Pecos (C.).

S. juno Fab. Beulah (C.).

S. n. sp. near juno. Beulah (C.).

S. austini Casey. Beulah (C.).

S. n. sp. near femoratus. Beulah (C.).

S. alpicola Fauvel. Beulah (C.).

S. arizonæ Casey. Coolidge (W.).

S. nimbosus Casey. Las Vegas (C.).

S. trajectus Casey. Beulah, identity uncertain (Mary Cooper).

Euæsthetus neomexicanus n. sp. Las Vegas (C.).

Cryptobium (Gastrolobium) texanum Lec. Albuquerque.

C. (Gastrolobium) vagum Horn. Albuquerque (W.), Pinos Altos (C.).

Lathrobium (Lathrotaxis) angusta Casey. Albuquerque.

L. (Lathrotaxis) acomana Casey. "New Mexico."

L. (Lathrobiella) ventrale Lec. Mesilla, identity uncertain (C.).

Pæderus compotens Lec. Mesilla Valley (C.).

P. nevadensis Austin. "N. M."

Neomedon piciventre n. sp. Cloudcroft (K.).

Medon nitidulum Casey. Coolidge (W.).

Paramedon n. sp. Las Vegas Hot Springs (B. and S.).

Medonodonta alutacea Casey. "N. M."

Scopæus texanus Casey. "New Mexico" (W.).

Stilicus oblitus n. sp. Beulah (C.).

Sunius longiusculus Mann. Beulah (Mary Cooper).

S. zuni Casey. Albuquerque (C.).

S. arizonensis Casey. New Mexico (W.), (cf. Casey). [The specimens from Beulah are not now at hand and may perhaps be this rather than *longiusculus*.]

Palaminus amplipennis n. sp. Pecos (C.).

Tachinus repandus Horn. Beulah (Skinner).

T. instabilis Mäkl. Cloudcroft (K.).

Tachyporus maculipennis Lec. Beulah (C.), Las Vegas (C.), Cloudcroft (K.). [Not typical, perhaps a distinct species.]

T. jocosus Say. Coolidge (W.), Beulah (C.).

T. nitidulus Fab. (*brunneus* Fab.), Albuquerque (W.), Coolidge (W.), Beulah (C.), Vallé Ranch, Pecos (C.).

Erchomus ventriculus Say. Romeroville (C.), Cloudcroft (K.).

Bryoporus rufescens Lec. Walnut Creek (S.). In Arizona it occurs at Tucson (H. and S.).

Mycetoporus humidus Say. Las Vegas (C.).

Trichophya lativentris Csy. ? Las Vegas Hot Springs (B. and S.).

Pseudopsis sulcata Newman. Cloudcroft (K.).

Bledius armatus Say. Albuquerque (W.), Roswell (C.).

B. ineptus Casey. Albuquerque (W.).
B. gravidus Casey. Albuquerque (W.).
B. ornatus Lec. Santa Fé Canon (S.).
B. emarginatus Say. Mesilla Valley (C.).
Platystethus americanus Er. Gallinas Canon (S.), Santa Fé Canon (S.), Albuquerque (W.), Santa Fé (C.), Beulah (C.).
Oxytelus fuscipennis Mann. Santa Fé Canon (S.).
O. invenustus Csy. Cloudcroft (K.).
O. alpicola Csy. Beulah (C.).
O. suspectus Csy. Manzanares Valley (Mary Cooper), Beulah (C.).
O. sp. Beulah (C.).
Trogophloeus dentiger Csy. Albuquerque (W.).
T. sp. San Geronimo (C.).
Apocellus analis Lec. Santa Fé (Fenyes).
A. sphæricollis Say. Albuquerque (W.), Mesilla (C.), Beulah (C.), Santa Rosa (K.), Alamogordo (V.).
Deleaster concolor Lec. Coolidge (W.), Watrous (C.).
Geodromicus ovipennis Lec. Gallinas Canon (S.), Santa Fé Canon (S.). Beulah (C.).
G. nubilatus Csy. Las Vegas (cf. Casey).
Homalium lapponicum Zett. Cloudcroft (K.), Beulah (C.).
H. pusillum Grav. Cloudcroft (K.).
H. n. sp. ? near foraminosum. Las Vegas Hot Springs (B. and S.).
H. n. sp., near humerosum Trout Spring (C.).
Anthobium tibiale Csy. Sacramento Mts. (K.), Beulah (C.), Cloudcroft (V.).
Megarthrus americanus Sachse. Las Vegas Hot Springs (B. and S.), Cloudcroft (K.).
Lispinus linearis Er. Roswell (C.).
Triga picipennis Lec. Santa Rosa (K.).
Siagonium punctatum Lec. Cloudcroft (K.). Also taken by Viereck.
S. sp. Santa Rosa (K.).
Micropeplus tesserula Curt. "New Mex." (S.).

SCAPHIDIIDÆ.

Bæocera texana Csy. Beulah (C.), Cloudcroft (K.), Las Vegas Hot Springs (B. and S.).
Scaphisoma castaneum Mots. Cloudcroft (K.).

PHALACRIDÆ.

Phalacrus penicellatus Say. Albuquerque (W.), Gallinas Canon (S.).
P. sayi Csy. Coolidge (W.), Wootens (K.).
P. simplex Lec. Near Dimmitt's Lake, Pecos Valley (C.).
Olibrus vittatus Lec. Gallinas Canon (S.).
O. nigricollis Lec. Wootens (K.), Pecos (C.), Las Vegas (Casey).
O. pallipes Say. Beulah (C.).
O. semistriatus Lec Beulah (C.), Wootens (K.).
O. wickhami Csy. Albuquerque (W.), Coolidge (W.).
Eustilbus apicalis Mels. Las Vegas (C.), Pecos (C.).
E. nitidus Mels. Near Las Vegas (C.), Walnut Creek (S.).
E. nanulus Csy. Albuquerque (W.).

COCCINELLIDÆ.

Paranæmia vittigera Mann. Albuquerque (W.). Las Vegas (C.), Rociada (C.), near Abiquiu (Wheeler Surv.), Santa Rosa (K.), Cloudcroft (K.).

Megilla macalata DeG. Mesilla Valley (C.), San Ildefonso (Wheeler Surv.).

Hippodamia 13-punctata L. Mescalero (C.), Aztec (Baker).

H. parenthesis Say. Gallinas Canon (S.), Albuquerque (W.), Coolidge (W.), Beulah (C.), Mesa above Beulah (C.), Ruidoso (T.), Glorieta (C.), Cloudcroft (V.), Las Vegas Hot Springs (B. and S.).

H. glacialis Fab. Mesilla Valley, det. Hamilton (C.).

H. quinquesignata Kirby. Albuquerque (W.), Water Canon (S.), Coolidge (W.), Santa Fé (Fenyes).

H. lecontei Muls. Albuquerque (W.), Gallinas Canon (S.), Coolidge (W.).

H. convergens Guér. Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (C.), Santa Fé Canon (S.), Coolidge (W.), Top of Las Vegas Range (C.), Las Vegas Hot Springs (S. and B.), Highrolls (V.), Alamogordo (V.), Cloudcroft (V.), Ruidoso (T.), Embudo (C.), Lone Mountain (C.), San Ildefonso (Wheeler Surv.), Sacramento Mts. (K.), Beulah (C.). Ranges from the Middle Sonoran to the Hudsonian, and is probably the most abundant beetle in New Mexico.

H. sinuata Muls. Santa Fé (C.), Albuquerque (W.), Colora'o (T.), Mescalero (C.), Las Vegas (C.), Sacramento Mts. (K.), Gallup (Fall).

H. oregonensis Cr. Walnut Creek (S.).

H. americana Cr. Fort Wingate (Casey).

H. falcigera Cr. Beulah (Skinner). [This and the two preceding are probably merely varieties of *spuria*.]

Adalia bipunctata var. *humeralis* Say. Placita, on flowers of wild plum (C.), Pecos (C.), Las Vegas Hot Springs (B. and S.).

A. frigida Schn. "New Mexico"; Las Vegas Hot Springs (B. and S.).

A. frigida var. *melanopleura* Lec. Las Vegas Hot Springs (B. and S.)

A. annectans Crotch. Beulah, on flowers of *Circuta* (C.); *transversalis* Csy., Las Vegas.

Agrabia cyanoptera Muls. Albuquerque (W.), "New Mexico" (cf. Casey and Leng).

Coccinella novemnotata Hbst. Gallinas Canon (S.), Albuquerque (W.), Pecos (C.), Top of Las Vegas Range (C.), Beulah (C.), Coolidge (W.), Santa Fé (Fenyes).

C. 9-notata var. *degener* Csy. Fort Wingate (Casey).

C. monticola Muls. Taos (Wheeler Surv.), also cf. Snow.

C. transversoguttata Fab. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.), Santa Fé (C.), Top of Las Vegas Range (C.), Aztec (Baker).

C. transversoguttata var. *nugatoria* Muls. Santa Fé (C.).

C. transversoguttata var. *alutacea* Csy. "New Mexico."

C. trifasciata L. Pecos (C.), Mescalero (C.), Beulah (C.). Ruidoso (T.), Wootens (K.).

C. difficilis Cr. Coolidge (W.), near Las Vegas (C.).

C. sanguinea L. Gallinas Canon (S.), Santa Fé Canon (S.), Pecos (C.).

C. oculata Fab. Mesilla Valley (T.), Mescalero (C.).

C. oculata var. *plagiata* Casey. Sacramento Mts. (K.).

C. oculata var. *fenestralis* Casey. Las Vegas (Casey).

C. oculata var. *abdominalis* Say. Gallinas Canon (S.), Water Canon (S.), Albuquerque (W.), Socorro (C.), Mesilla Valley (C.), Sacramento Mts. (K.), Las Vegas Hot Springs (B. and S.).

Harmonia picta Rand. Gallinas Canon (S.), Coolidge (W.), Eagle Creek (T.), Wootens (K.), Las Vegas Hot Springs (B. and S.).

Anatis lecontei Casey. Gallinas Canon (S.), Coolidge (W.), Beulah (C.), Rociada (C.), Ruidoso (T.), Fort Wingate (Casey), near Cloudcroft (K.), Las Vegas Hot Springs (B. and S.). [Previously confused with *rathvoni*.]

Neomysia hornii Cr. Coolidge (W.), Santa Fé (Myrtle Boyle), Tsuque (Fenyes), Las Vegas Hot Springs (B. and S.).

N. hornii var. *interrupta* Casey. Fort Wingate (Casey), Santa Fé (Fenyes), Gallinas Canon (*subvittata*) (S.), Santa Fé Canon (S.).

Psyllobora 20-maculata Say. Gallinas Canon (S.), Ruidoso (T.), Sacramento Mts. (K.), Santa Fé (Fenyes).

P. 20-maculata var. *tædata* Lec. Ruidoso 6600 ft. on *Rhus* (Wooton), Pecos (C.), Wootens (K.), Las Vegas Hot Springs, a doubtful variety (B. and S.), Highrolls (V.).

Epilachna corrupta Muls. Gallinas Canon (S.), Water Canon (S.), Albuquerque (W.), Mesilla Valley (C.), San Ildefonso (Wheeler Surv.), Santa Fé (C.), Pecos (C.), San Ignacio (C.), Rinconada (C.), Cliff, destructive to beans (Gila Farm Coy.), near Wootens (K.).

Chilocorus bivulnerus Muls. Santa Fé (C.), Albuquerque (W.), Mesilla Valley (C.), Tierra Amarilla (Wheeler Surv.), Las Vegas Hot Springs, a variety (B. and S.).

C. cacti L. Mesilla Valley (C.).

Axion plagiatum Oliv. Gallinas Canon (S.).

A. plagiatum var. *alutaceum* Casey. Las Vegas (Casey), Las Vegas Hot Springs (B. and S.).

Exochomus marginipennis Lec. Albuquerque (W.), Mesilla Valley (C.).

E. marginipennis var. *hægei* Gorh. Deming (Schwarz), San Antonio (Allaire), Santa Fé (Fenyes), Sacramento Mts. (K.).

E. marginipennis var. *æthiops* Bland. Albuquerque (W.), Gallinas Canon (S.), Coolidge (W.), Beulah (C.), Las Vegas Hot Springs (B. and S.).

Zagloba ornata Horn. Las Vegas Hot Springs (B. and S.).

Brachyacantha ursina Fab. San Ignacio (C.), Pecos (C.), Santa Fé (Fenyes), Las Vegas Hot Springs (B. and S.).

B. ursina var. 10-*pustulata* Mels. Gallinas Canon (S.).

B. ursina var. *tau* Lec. Santa Fé (Fenyes).

Hyperaspis lateralis Muls. Mesilla Valley (C.), Santa Fé (Fenyes), Las Vegas Hot Springs, common and very variable on *Pinus edulis* (B. and S.).

H. hæmatosticta n. sp. Santa Fé (Fenyes), Las Vegas Hot Springs, on *Pinus edulis* (B. and S.).

H. proba var. *trinifer* Casey. Las Vegas (Casey).

H. gemina Lec. Las Vegas Hot Springs (B. and S.).

H. osculans Lec. Mesilla Valley (C.). In Arizona it occurs at Tucson (H. and S).

H. fimbriolata Melsh. Gallinas Canon (S.), Coolidge (W.), near Las Vegas

(C.), Truchas Peaks (W. P. C.), near Lea Lake, Pecos Valley (C.), Beulah (Skinner), near Cloudcroft (K.). Las Vegas Hot Springs (S. and B.), Santa Rosa (K.).

H. undulata Say. Albuquerque (W.). Mesilla Valley (C.), Coolidge (W.).

H. 4-vittata Lec. Albuquerque (W.), Coolidge (W.), Las Vegas (C.), Las Vegas Hot Springs (B. and S.).

Hyperaspidius trimaculatus L. Mesilla Valley (T.), Coolidge (W.), Las Vegas (C.), Pecos (C.), Las Vegas Hot Springs (B. and S), Alamogordo (V.).

H. ingenitus Csy. Las Cruces (C.), probably a variety of the preceding.

Nipus n. sp. Las Vegas Hot Springs (B. and S.).

Microweisea misella Lec. Mesilla Valley (C.), Santa Fé (Fenyes).

Stethorus punctum Lec. New Mexico (cf. Horn), Albuquerque (W.).

S. atomus Csy. Highrolls (V.). [Here probably should be placed the New Mexican specimens placed by Horn with his *Scymnus utilis.*]

Scymnus flavescens Csy. Santa Fé (Fenyes).

S. nugator Csy. Identity not certain, Santa Fé (Fenyes).

S. fraternus Lec. Albuquerque (W.).

S. marginicollis Mann. Albuquerque (W.), Santa Fé (C.).

S. collaris Mels. Gallinas Canon (S.), Mesilla, det. Ashmead (C.), Santa Rosa (K.).

S. horni Gorh. Alamogordo (V.), Highrolls (V), Cloudcroft (V.). In Arizona at Tucson (H. and S.).

S. socer Lec. Albuquerque (W.). [This identification is doubtful, as is also the suggested synonymy of both Horn and Casey.]

S. cockerelli Casey. Albuquerque (C.).

S. ardelio Horn. Mesilla Valley (C.), Beulah (C.), Pecos (C.).

S. cinctus Lec. Mesilla Valley (C.).

S. strabus Horn. "New Mexico" (cf. Horn), Las Vegas Hot Springs (B. and S.).

S. coniferarum Cr. Las Vegas Hot Springs (B. and S.), Cloudcroft (K.).

S. nanus Lec. "New Mexico" (cf. Horn).

S. opaculus Horn. Las Vegas Hot Springs (B. and S.).

S. coloradensis Horn. Pecos (C.).

S. sordidus Horn. Deming (Schwarz).

S. intrusus Horn. Albuquerque (C.).

S. sp. near monticola Csy. "N. M." (coll. Fall).

S. sp. near uteanus Csy. Highrolls (V.).

S. virginalis Wick. Cloudcroft (V.). [Not a true *Scymnus.*]

Cephaloscymnus occidentalis Horn. Las Vegas Hot Springs (B. and S.).

ENDOMYCHIDÆ.

Lycoperdina ferruginea Lec. Beulah (C.).

Aphorista morosa Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Harveys Ranch (C.), Sacramento Mts. (K.), Cloudcroft (V.).

Epipocus unicolor Horn. Gallinas Canon (S.), Las Vegas Hot Springs (B. and S.).

EROTYLIDÆ.

Acropteroxys gracilis Newm. Water Canon (S.).

A. divisa Horn. "New Mexico" (cf. Horn).

Tritoma thoracica Say. Santa Fé (Fenyes).

T. mesosternalis Schaef. Santa Fé (Fenyes), Cloudcroft (K.). [This species was described under the generic name *Triplax*, following the lead of certain European authors; I am not yet satisfied that the change is necessary.]

Cypherotylus aspersus Gorh. [Formerly identified as *Erotylus boisduvalli* Chev.] Water Canon (S.), Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Grant Co. (Howard), Beulah (C.), near Santa Fé (Fendler).

COLYDIIDÆ.

Lasconotus concavus Casey. Cloudcroft (K.), Las Vegas (Meska), Las Vegas Hot Springs (B. and S.).

Aulonium sp. Las Vegas Hot Springs (B. and S.).

Bothrideres montanus Horn. Santa Fé Canon (S.), Beulah (Skinner), Las Vegas Hot Springs (B. and S.).

CUCUJIDÆ.

Silvanus surinamensis L. Roswell (C.).

Cathartus advena Waltl. Roswell (C.), Beulah (Skinner).

Nausibius clavicornis Kugel. "New Mexico" (cf. LeConte), Mesilla Valley, introduced (C.).

Narthecius monticola n. sp. Cloudcroft (K.).

Pediacus fuscus Er. Gallinas Canon (S.).

Cucujus clavipes Fab. San Ildefonso (Wheeler Surv.).

C. clavipes var. *puniceus* Mann. Mesilla (C.).

CRYPTOPHAGIDÆ.

Antherophagus pallidivestis Csy. Beulah, in nest of *Bombus* (W. P. C.), Cloudcroft (K.), Wootens (K.). It is not in Wickham's Colorado list, but was taken in 1906 at Florissant (C.).

Cryptophagus (Salebius) tarsalis Csy. "New Mexico" (S.).

Henoticus serratus Gyll. Pecos (C.).

Agathengis forticornis Csy. Coolidge (W.).

A. sp. Wootens (K.).

Atomaria ephippiata Zimm. Pecos (C.).

MYCETOPHAGIDÆ.

Mycetophagus confusus Horn. Beulah, in nest of *Bombus* (W. P. C.), Santa Fé (Fenyes), Cloudcroft (K.). Knaus found it under pine bark.

Litargus balteatus Lec. Albuquerque (W.), Mesilla, in a fungus (C.), Las Vegas Hot Springs (Fall).

L. nebulosus Lec. Las Cruces (cf. Casey, Jn. N. Y. Ent. Soc., 1900).

Typhæa fumata L. Albuquerque (W.), Mesilla Valley (C.), Deming (Schwarz).

DERMESTIDÆ.

Dermestes marmoratus Say. Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), La Trementina (Alice Blake), Chaves (T.), Santa Fé (C.), Pinos Altos (C.), Cloudcroft (V.), Highrolls (V.), Alamogordo (V.).

D. caninus Germ. Water Canon (S.), Alamorgodo (V.).

D. fasciatus Lec. Albuquerque (W.), Fort Wingate (Casey), Placita (C.).

D. talpinus Mann. Gallinas Canon (S.).

D. vulpinus Fab. Water Canon (S.), Santa Fé Canon (S.), Mesilla Valley (C.), Albuquerque (C.).

D. lardarius L. Las Vegas (C.), Pecos (C.).

D. signatus Lec. Fort Wingate (Casey).

Attagenus piceus Oliv. Mesilla Valley (C.).

A. elongatulus Csy. Pecos (C.).

Novelsis hornii Jayne. Mesilla Valley (C.), Santa Fé (C.), Alamogordo (V.), Las Vegas (Clara Gerhardt).

N. byturoides Cr. Alamogordo (V.).

N. varicolor Jayne. Alamogordo (V.).

Trogoderma tarsale Mels. Mesilla Valley (T.).

T. sternale Jayne. Mesilla Valley (C.), Santa Fé (C.), Albuquerque (W.), Coolidge (W.).

T. oblongula Csy. Beulah, identity not certain (C.), Alamogordo (V.).

T. sp. Alamogordo (V.).

Cryptorhopalum reversum Csy. Fort Wingate (Shufeldt), Highrolls (V.).

C. pruddeni Csy. Alamogordo (V.).

C. balteatum Lec. Mesilla Valley (C.).

C. apicale Mann. "New Mexico" (cf. Snow).

C. ruficorne Lec. Deming (Schwarz). [Probably wrongly identified.] Schwarz reports it also from Tucson, Ariz. (H. and S.).

C. fusculum Lec. (?) Alamogordo (V.).

Anthrenus scrophulariæ L. Las Vegas (C.), Pecos (C.), Alamogordo (V.).

A. scrophulariæ var. *flavipes* Lec. Coolidge (W.).

A. verbasci L. Albuquerque (W.), Gallinas Canon (S.), Mesilla Valley (T.).

Orphilus ater Er. Trout Spring (C.), Beulah (C.), Pecos (C.), Cloudcroft (V.), Sacramento Mts. (K.).

O. ater var. *subnitidus* Lec. Gallinas Canon (S.), Santa Fé Canon (S.). Wickham gives ten Colorado localities for *subnitidus*, but none for *ater* proper; the latter, however, occurs at Halfway House, Pike's Peak (C.).

HISTERIDÆ.

Hololopta populnea Lec. Mesilla Valley (T.).

Hister subopacus Lec. Cloudcroft, under pine bark (K.). [Identity not certain.]

H. instratus Lec. Gallinas Canon (S.).

H. sculpticauda Csy. Fort Wingate.

H. ulkei Horn. Coolidge (W.), Lone Mt. (C.), Mesilla Valley (C.), Zuni (T.), between Pinos Altos and Silver City (C.).

H. cœnosus Er. "New Mexico" (coll. Fall).

H. abbreviatus Fab. Gallinas Canon (S.), Sta. Fé Canon (S.), Albuquerque (W.).

H. depurator Say. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.), Sacramento Mts. (K.).

H. incertus Mars. "New Mexico" (coll. Fall).

H. militaris Horn. Coolidge (W.), Santa Fé (Fenyes), Santa Rosa (K.), Alamogordo (K.).

H. indistinctus Say. "New Mexico" (cf. Horn).

H. pollutus Lec. "Kansas and New Mexico" (cf. Leconte, 1859).

Platysoma lecontei Mars. Mesilla Valley (C.).

P. punctigera Lec. Beulah (Skinner), Cloudcroft (K.), Las Vegas Hot Springs (Fall).

Epierus regularis Beauv. Albuquerque (W.).

E. nasutus Horn. Gallinas Canon (S.).

E. cornutus Csy. Las Vegas (Casey).

Hetærius tristriatus Horn. Coolidge (W.).

Paromalus estriatus Lec. Mesilla Valley (T.).

P. debilis Lec. Slight variety, Cloudcroft (V.).

Saprinus discoidalis Lec. Engle (Nora Newberry), Santa Fé (Fenyes).

S. pectoralis Lec. Alamogordo (V.).

S. alienus Lec. Alamogordo (V.).

S. lugens Er. Gallinas Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Coolidge (W.), Pinos Altos (C.), Santa Fé (Fenyes).

S. pennsylvanicus Payk. Water Canon (S.), Albuquerque (W.), Gallup (W.), Deming (C.), Santa Fé (Fenyes).

S. profusus Csy. Santa Rosa (K.). [Very close to and perhaps only a var. of the preceding.]

S. oregonensis Lec. Gallinas Canon (S.). Santa Fé Canon (S.), Coolidge (W.), Santa Rosa (K.), Pecos (C.).

S. oregonensis v. *distinguendus* Mars. Mesilla Valley (C.), Santa Fé (Fenyes).

S. assimilis Payk. "New Mexico" (coll. Fall).

S. contractus Csy. (?) Alamogordo (V.).

S. neglectus Mars. Gallinas Canon (S.), Water Canon (S.).

S. vitiosus Lec. Alamogordo (V.).

S. lubricus Lec. Pecos (C.).

S. plenus Lec. Mesilla Valley (C.), Gallup (W.), Sacramento Mts. (K.), Alamogordo (V.).

S. fimbriatus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Gallup (W.), Albuquerque (W.).

S. fimbriatus var. *desertorum* Mars. New Mexico (W.).

S. cærulescens Lec. var. Deming (C.). [Differs by surface less opaque and humeral stria less completely obliterated.]

S. patruelis Lec. Deming (Schwarz).

Plegaderus sayi Mars. Beulab, in nest of *Bombus juxtus* (W. P. C.), Santa Fé (Fenyes).

P. nitidus Horn. var. Common in chambers of Scolytids under pine bark, Cloudcroft (K.), also taken by Viereck.

P. consors Horn. Cloudcroft (K.).

Acritus exiguus Er. "New Mexico" (Fuchs coll.).

NITIDULIDÆ.

Brachypterus urticæ Fab. Beulah (C.).

Cercus sericans Lec. Sacramento Mts. (K.).

Carpophilus yuccæ Cr. Alamogordo (V.).

C. hemipterus L. Mesilla Valley (T., C.).

C. pallipennis Say. Santa Fé Canon (S.), Mesilla Valley (C.), Cloudcroft (K.), Pecos (C.), Santa Fé (C.), (Wheeler Survey), Alamogordo (V.).

C. dimidiatus Fab. (*mutilatus* Fab). Gallinas Canon (S.).

C. decipiens Horn. Albuquerque (W.).

C. niger Say. Albuquerque (W.), Mesilla Valley (C.), Gallup (W.), Santa Fé (C.).

C. discoideus Lec. Gallup (W.).

C. zuni Csy. Sacramento Mts. (K.), Beulah (Skinner), Albuquerque (W.).

Epuræa rufa Say Gallinas Canon (S.).

E. integra Horn. Beulah, in nest of *Bombus* (W. P. C.).

E. ambigua Mann. Cloudcroft (K.).

E. papagona Csy. Beulah, identity not certain (Skinner).

E. immunda Sturm. Sacramento Mts. (K.), *infuscata*, Gallinas Canon (S.).

E. immunda var. *flavomaculata* Mäkl. Sacramento Mts. (K.).

E. adumbrata Mann. Beulah, identity not certain (Skinner).

E. truncatella Mann. "New Mexico" (cf. Snow), top of Las Vegas Range, identity doubtful (C.).

E. alticola n. sp. Top of Las Vegas Range (C.).

E. æstiva L. "New Mex." (cf. Snow), Beulah (C.).

Nitidula bipunctata L. Near Cloudcroft (K.).

N. ziczac Say. Gallinas Canon (S.), Coolidge (W.), Albuquerque (W.), Beulah (Skinner), Alamogordo (V.).

Omosita discoidea Fabr. Beulah (C.), Roswell (C.).

Soronia undulata Say. Gallinas Canon (S.).

Perthalycra murrayi Cr. Gallinas Canon (S.), Sta. Fé Canon (S.), Pecos (C.).

Pocadius fulvipennis Er. Las Vegas Hot Springs (B. and S.).

Orthopeplus quadricollis Horn. Walnut Creek (S.), Cloudcroft (K.).

Meligethes mutatus Har. Santa Fé (C.), Albuquerque (W.), Gallup (W.), Beulah (C.), Glorieta (C.), Sierra Blanca region (Wooton), Wootens (K.).

M. ruficornis Lec. Gallinas Canon (S.), Santa Fé Canon (S.), near Abiquiu (Wheeler Surv.).

Cryptarcha concinna Melsh. Cloudcroft (V.).

Ips cylindricus Lec. Las Vegas Hot Springs (Fall), Cloudcroft (K.).

Pityophagus cephalotes Lec. Water Canon (S.).

P. rufipennis Horn. Walnut Creek (S.).

P. verticalis Horn. Gallinas Canon (S.), Eagle Creek (T.), Sta. Fé (Fenyes).

Rhizophagus dimidiatus Mann. Walnut Creek (S.).

R. procerus Casey. Cloudcroft (K.).

R. sp. Cloudcroft (K.). Very close to *minutus*, and perhaps only a variety of it. Knaus found it common under bark of quaking aspen.

LATHRIDIIDÆ.

Coninomus constrictus Gyll. "New Mexico" (S.).

Cartodere filum Aubè. Las Vegas (Frank Springer).

Corticaria rudis Fall. Coolidge (W.).

C. serrata Payk. "New Mexico."

C. dentigera Lec. "New Mexico" (S.).

C. ferruginea Marsh. "New Mexico" (S.), Ponil Canon (Miss Grace Eaton).

Melanophthalma americana Mann. Mesilla Valley (C.), Beulah, in nest of *Bombus* (W. P. C.), Cloudcroft (K.), Las Vegas (C.).

M. cavicollis Mann. Coolidge (W.).

TROGOSITIDÆ.

Nemosoma cylindricum Lec. (or n. sp.). Las Vegas Hot Spgs. (B. and S.).

Alindria teres Mels. Mesilla, in a fungus (C.), Highrolls (V.).

Trogosita virescens Fab. Gallinas Canon (S.), Wootens (K.), Pecos (C.), Cloudcroft, bronze form, perhaps distinct species (K.).

Tenebrioides corticalis Mels. Gallinas Canon (S.), Santa Fé Canon (S.), Mesilla, identity doubtful (C.).

T. sinuata Lec. Cloudcroft (V.).

T. mauritanica L. Mesilla Valley (C.).

T. sp. dub. Pecos (C.).

Calitys scabra Thunb. Harvey's Ranch (Ruth Raynolds).

Peltis pippingskœldi Mann. Santa Fé Canon (S.), Cloudcroft (K.).

P. ferruginea L. Cloudcroft (K.).

MONOTOMIDÆ.

Monotoma parallela Lec. Albuquerque (W.).

M. quadrifoveolata Aubé. Albuquerque (W.).

Europs striatulus n. sp. Cloudcroft (K.), Las Vegas Hot Springs (B. and S.).

Bactridium striatum Lec. Albuquerque (W.).

BYRRHIDÆ.

Pedilophorus lateralis n. sp. Las Vegas, June (C.).

Byrrhus cyclophorus Kirby. Walnut Creek (S.).

B. murinus Fab. "San Ignacio with *Lasius*" (C.).

Limnichus perpolitus Csy. Albuquerque (W.).

L. analis Lec. Santa Fé Canon (S.). In Arizona at Tucson (H. and S.).

PARNIDÆ.

Dryops striatus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), San Geronimo (W. P. C. and M. Cooper), Beulah (Skinner), Las Vegas Hot Springs (C.), Sacramento Mts. (K.), Las Vegas (C.), Pecos (C.), Cloudcroft (V.), Highrolls (V.).

D. suturalis Lec. Las Vegas (C.), Las Vegas Hot Springs (C.).

Elmis concolor Lec. Santa Fé Canon (S.).

E. pecosensis n. sp. Pecos (C.).

E. divergens Lec. Santa Fé Canon (S.).

E. addendus n. sp. Pecos (C.).

E. similis Horn. Abiquiu, hot springs (Wheeler Survey). In Arizona at Tucson (H. and S.).

E. antennatus n. sp. Beulah (C.).

HETEROCERIDÆ.

Heterocerus pallidus Say. Mesilla Valley (C.).

H. undatus Mels. Mesilla Valley (C.).

H. gemmatus Horn. Albuquerque (W.).

DASCYLLIDÆ.

Eucinetus infumatus Lec. var. Cloudcroft (K.).

RHIPICERIDÆ.

Sandalus californicus Lec. Walnut Creek (S.).
S. porosus Lec. Zuni (T.).

ELATERIDÆ.

Melasis n. sp. Las Vegas Hot Springs (S. and B.).

Deltometopus amœnicornis Say. Gallinas Canon (S.), Las Vegas Hot Springs (S. and B.).

Anelastes drurii Kirby. Gallinas Canon (S.), Santa Fé Canon (S.), Ruidoso (T.), Pecos (Wheeler Surv.), between Sta. Fé and Fort Wingate (Wheeler Surv.).

A. drurii v. *latreillei* Lec. Santa Fé (C.), Albuquerque (W.), Coolidge (W.).

Epiphanis cornutus Esch. Cloudcroft (K.).

Adelocera rorulenta Lec. Gallinas Canon (S.).

A. pyrsolepis Cand. Coolidge (W.), Pecos (M. Grabham).

Lacon rectangularis Say. Wiegand Ranch, near Las Vegas (C.).

Meristhus scobinula Cand. Albuquerque (W.).

Chalcolepidius apacheanus Csy. Walnut Creek (S.), Grant Co. (Howard). [In both the above records the species is given as *webbii*. The specimen taken by Snow has been sent me and proves to be *apacheanus;* the Grant County one must remain doubtful.]

Alaus melanops Lec. Gallinas Canon (S.).

A. lusciosus Hope. Mesilla Valley (T.), Mesilla Park (Nora Newberry).

Cardiophorus longior Lec. Santa Fé Canon (S.), Mesilla Valley, presumably this, det. Hamilton as "*longulus*" (C.).

C. pubescens Blanchard. "New Mexico" (Tr. Am. Ent. Soc, 1889).

C. nevadensis Blanchard. Las Vegas Hot Springs (S. and B.).

Horistonotus vulneratus Horn. Deming (W.).

H. simplex Lec. Deming (Schwarz), Mesilla (C.).

Cryptohypnus abbreviatus Say. Pecos (C.).

C. nocturnus var. *bicolor* Esch. Santa Fé Canon (S.).

Hypnoideus striatulus Lec. Pecos (C.).

H. tumescens Lec. Top of Las Vegas Range (C.).

H. pectoralis Say. Santa Fé Canon (S.).

Physorhinus fusculus Champ. (*Anchastus frontalis* Horn.) Las Vegas (S.).

Monocrepidius vespertinus Fab. Tierra Amarilla (Wheeler Survey).

M. athoides Lec. Mesilla (C.), Mesilla Park, at light (C.).

M. sordidus Lec. Albuquerque (W.), Deming (Schwarz), Colora'o (C.), Roswell (C.), Santa Fé (Fenyes).

M. auritus Hbst. (?) Near Las Vegas (C.).

Ischiodontus ferreus Lec. Mesilla Valley (C.).

I. sp. Thornton (Fenyes).

Elater rhodopus Lec. Rio Ruidoso (T.). [A little more finely punctate than typical form.]

E. rubriventris Lec. Coolidge (W.), Las Vegas (S.), San Ignacio (C.), Pecos (C.).

E. cordatus Horn. Sacramento Mts. (K.).

E. ater Lec. Pecos (Dr. Grabham).

E. nigrinus Payk. Gallinas Canon (S.).

E. pullus Cand. Gallinas Canon (S.).

E. mœrens Lec. Sacramento Mts. (K.), Cloudcroft, identity doubtful (V.).

E. apicatus Say. Sacramento Mts. (K.).

E. sp. dub. Cloudcroft (V.).

E. sp. dub. Cloudcroft (V.).

Drasterias elegans Fabr. Roswell (C.), Albuquerque (W.), Coolidge (W.), Colora'o (C.), Alamogordo (K.), Deming (Schwarz), Mesilla Park (C.), Las Vegas (C.), Santa Fé (Fenyes), Thornton (Fenyes).

Ludius hepaticus Germ. Colora'o (C.). [Probably an erroneous identification.]

L. texanus Lec. Las Vegas (Gilbert Rosenwalt), La Trementina (Alice Blake).

L. rubicundus Champ. Mesilla Park (C.). Identity not quite certain, fide Blanchard *in litt.*

L. uniformis Blanch. MS. La Trementina (Alice Blake).

Dolopius lateralis Esch. Mesilla Valley, variety (C.), Beulah (C.), Placita (C.), Pecos (C.), Santa Fé (Fenyes), Las Vegas Hot Springs (S. and B.).

Glyphonyx recticollis Say. Water Canon (S.), Mesilla Park (C).

G. sp. Colora'o (C.).

Melanotus castanipes Payk. Sacramento Mts. (K.).

M. communis Gyll. Las Vegas Hot Springs (B. and S.).

M. fissilis Say. Gallinas Canon (S.), Santa Fé (C.), Mesilla Valley (C.), Cloudcroft (K.).

M. exuberans Lec. Gallinas Canon (S.).

M. paradoxus Mels. Walnut Creek (S.).

M. sp. Cloudcroft (K.).

M. sp. Pecos (C.).

Athous cribratus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Top of Las Vegas Range (C.), Beulah (C.), Cloudcroft (K.).

A. jejunus n. sp. Cloudcroft (K.).

A. rufotestaceus n. sp. Beulah (C.).

Corymbites rupestris Germ. Santa Fé Canon (S.).

C. planulus Lec. Pecos (C.).

C. hieroglyphicus Say. Las Vegas Hot Springs (B. and S.).

C. æripennis Kirby. Walnut Creek (S.).

C. inflatus Say. Gallinas Canon (S.).

Hemicrepidius carbonatus Lec. Gallinas Canon (S.), Las Vegas Hot Springs (B. and S.).

H. soccifer Lec. "New Mexico."

H. memnonius Hbst. Gallinas Canon (S.), Las Vegas (C.).

Eniconyx gracilis Horn. "New Mexico."

Aphricus luteipennis n. sp. Deming (W.).

Plastocerus n. sp. Highrolls (V.).

Cebrio compositus n. sp. Santa Fé (Fenyes).

THROSCIDÆ.

Throscus sericeus Lec. Pecos (C.).

BUPRESTIDÆ.

Gyascutus planicosta Lec. Mesilla Valley (C.), Deming (W.).

Chalcophora angulicollis Lec. Gallinas Canon (S.), Las Vegas Hot Springs (C.), Pecos (C.).

Psiloptera drummondi var. *webbii* Lec. Water Canon (S.), Mesilla Valley (C.), Grant Co. (Howard).

Dicerca prolongata Lec. Gallinas Canon (S.), Mesilla Valley, unusually large (C.).

D. sexualis Cr. Gallinas Canon (S.).

Trachykele blondeli Marseul. Sta Fé (Fenyes), cf. Ent. News, 1906, p. 163.

Pœcilonota cyanipes Say. Gallinas Canon (S.).

Buprestis consularis Gory. Gallinas Cannon (S.).

B. nuttalli Kirby. Gallinas Canon (S.), Water Canon (S.), Grant Co. (Howard), Las Vegas Hot Springs (S. and B.).

B. maculiventris Say. Santa Fé (C.), Gallinas Canon (S.), Santa Fé Canon (S.), Grant Co. (Howard), Beulah (Beyer).

B. maculiventris subornata Lec. Las Vegas Hot Springs (S. and B.).

B. maculiventris rusticorum Kirby. Beulah (C.), Cloudcroft (K.), Las Vegas Hot Springs (S. and B.).

B. fasciata langii Mann. Gallinas Canon (S.), Beulah (C.), (Beyer).

B. aurulenta L. Gallinas Canon (S.), Santa Fé Canon (S.), Las Vegas, from board of sidewalk (Chas. Ward), Las Vegas Hot Springs (S. and B.).

B. adjecta Lec. Gallinas Canon (S.).

Melanophila miranda Lec. Grant Co. (Howard), Fort Wingate (Wheeler Survey), between Santa Fé and Fort Wingate (Wheeler Survey), San Ildefonso (Wheeler Survey), Ft. Union (Maj. Sibley).

M. acuminata DeG. (*longipes* Say). Gallinas Canon (S.), Mesilla Valley (C), Las Vegas Hot Springs (B and S.).

M. atropurpurea Say. Near Abiquiu (Wheeler Survey). In Arizona at Tucson (H. and S.).

M. drummondi Kirby. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (Beyer), Ponil Canon (Miss Grace Eaton).

M. gentilis Lec. Gallinas Canon (S.), Beulah (Beyer).

Anthaxia æneogaster Lap. Gallinas Canon, as *A. inornata* Rand. (S.), Pecos (C.), Cloudcroft (V.), Beulah, on *Rosa* (C.), Sacramento Mts. (K.), Ruidoso Creek, 7500 feet, on *Rosa* (Wooton). Wooton's specimen is reported from *Rosa fendleri*, but the so-called *R. fendleri* of Ruidoso Creek is presumably *R. neomexicana*.

A. flavimana Gory. Gallinas Canon (S.), Sacramento Mts. (K.).

Chrysobothris atabalipa Lap. Mesilla Valley, a variety (C.).

C. debilis Lec. Mesilla Valley (T.).

C. femorata Fab. Santa Fé Canon (S.), Sacramento Mts. (K.).

C. cuprasens Lec. Santa Fé (C.), Coolidge (W.), Pecos (C.), Las Vegas Hot Springs (B. and S), Cloudcroft (K.). The type was found near Santa Fé by Fendler.

C. ignicollis Horn. Santa Fé (Fenyes).

C. dentipes Germ. Gallinas Canon (S.), Beulah (C.), (Beyer), Pecos (C.).

C. ludificata Horn. New Mex. (cf. Horn), Beulah (Skinner, C.), Pecos (C.), Las Vegas Hot Springs (B. and S.).

C. trinervia Kirby. Gallinas Canon (S.), Santa Fé Canon (S.).

C. carinipennis Lec. Ruidoso (T.), Pecos (C.).

C. californica Lec. Santa Fé (C.), Coolidge (W.).

C. quadrilineata Lec. Gallinas Canon (S.), Water Canon (S.), Santa Fé (Fenyes). The type was found at Santa Fé by Fendler.

C. exesa Lec. Mesilla Valley, on Mesquite (C.).

C. texana Lec. Coolidge (W.).

C. æneola Lec. "New Mexico" (S.).

C. convexa n. sp. Alamogordo (V.).

Thrincopyge alacris Lec. San Andreas Mts. (T.).

T. ambiens Lec. Mesilla Valley (T.).

Acmæodera maculifera Horn. Mesilla Valley (C.).

A. falli Kerremans. "New Mexico" (Fall).

A. amplicollis Lec. Water Canon (S.), Fillmore Canon, Organ Mts. (T.), Riley's Ranch, Organ Mts. (C.).

A. disjuncta Fall. La Cueva, Organ Mts. (T.).

A. amabilis Horn. Walnut Creek (S.), Magdalena Mts. (S.).

A. recticollis Fall. "New Mexico," Mesilla Park, on *Fallugia*, not quite typical (C.).

A. miliaris Horn. Walnut Creek (S.). [This is probably incorrectly identified; the species is probably *sparsus*.]

A. sparsa Horn. Organ Mts., back of San Augustine, on *Chrysopsis villosa* (W.), Beulah (W. P. C.), Ruidoso Creek (T.), Las Vegas Hot Springs (B. and S.), Magdalena Mts. (S.).

A. ornata Fab. Water Canon (S.), Santa Fé Canon (S.).

A. variegata Lec. Albuquerque, a variety (W.), Aztec (Baker).

A. decipiens Lec. "New Mexico."

A. scalaris Mann. (mima, auctt.). Soledad Canon, Organ Mts. (T.), Mesilla Valley, on *Verbesina* (C.).

A. pulchella Hbst. (incl. *mixta* Lec.). Pecos (C.), Gallinas Canon (S.), Santa Fé Canon (S.), Soledad Canon, Organ Mts. (T.), Engle (Nora Newberry), Coolidge (W.), Chicorico Canon, near Raton (C.), Las Vegas Hot Springs (Rishel), Red Mesa, var. *mixta* Lec. (Boyle), Aztec (Baker).

A. subbalteata Lec. "New Mexico," identity not certain (cf. Fall.).

A. tubulus Fab. Las Vegas Hot Springs, on flowers of *Erigeron* (C.), also collected there by Schwarz and Barber; *culta*, Gallinas Canon (S.), Mesilla Valley (T.).

A. quadrivittata Horn. Mesilla Valley (C.), Soledad Canon, Organ Mts. (C.). The latter (on *Opuntia*, May 22) is near *neglecta* and *quadrivittata*, and may be a new species.

A. gibbula Lec. Colora'o (C.).

Chrysophana placida Lec. Gallinas Canon (S.), Coolidge (W.).

Agrilus lateralis Say. "New Mexico."

A. pinalicus Wickham. Parker's Well, Organ Mts. (C.).

A. couesii Lec. Santa Fé (C.).

A. walsinghami Cr. "New Mexico;" Santa Fé (Fenyes).

A. pulchellus Bland. Near Rowe (C.).

A. townsendi n. sp. Rio Ruidoso (T.).

A. politus Say. Santa Fé (C.), Gallinas Canon (S.), Beulah (C.), Pecos (C.), Las Vegas Hot Springs, on willow (B. and S.).

A. interruptus Lec. Gallinas Canon (S.).

A. ventralis Horn. "New Mexico."

A. palmacollis Horn. Wootens (K.), Alamogordo (V.).

A. mercurius Wickham. Deming (W.), Pecos (C.).

A. addendus Cr. La Cueva, Organ Mts. (T.).

A. lacustris Lec. Pecos (C.), Santa Fé (Fenyes).

A. egenus Gory. Gallinas Canon (S.), Sacramento Mts. (K.).

A. sp. dub. Wootens (K.).

Taphrocerus gracilis Say (?). Las Vegas Hot Springs (S. and B.), Santa Rosa (K.).

Brachys ærosa Melsh. Gallinas Canon (S.), Sacramento Mts. (K.), Rociada (C.).

B. ovata Weber. Las Vegas Hot Springs (S. and B.).

Pachyscelus purpureus Say. Gallinas Canon (S.).

LAMPYRIDÆ.

Rhyncheros sanguinipennis Say. Gallinas Canon (S.), Beulah (C.), Cloudcroft (K.).

Lycus cruentus Lec. Walnut Creek (S.). In Ariz. at Tucson (H. and S.).

L. fernandezii Dugès. Walnut Creek (S.), Las Cruces (C.), Organ Mts. (C.), Dripping Spring, Organ Mts., on *Lippia wrightii*, Aug., identity not certain (C.).

Lycostomus fulvellus Lec. Gallinas Canon (S.), Sacramento Mts. (K.), Magdalena Mts. (S.).

L. loripes Chevr. Walnut Creek (S.).

L. n. sp. Alamogordo (V.).

Cæniella amplicornis Lec. Gallinas Canon (S.). *Cæniella* is a new name for *Cænia* Newman, 1838, preoccupied for a genus of Diptera (Desv., 1830).

Eros aurora Hbst. Walnut Creek (S.), above Barker's Lake, Las Vegas Range (W. P. C.), Beulah (C.).

Plateros modestus Say. Gallinas Canon (S.).

P. canaliculatus Say. Gallinas Canon, a variety (S.).

P. sp. Las Vegas Hot Springs (B. and S.).

P. sp. nov. Beulah (C.).

Lygistopterus rubripennis Lec. Ruidoso Creek (T.), Gallinas Canon (S.).

Lycaina discoidalis Horn. Alamogordo (V.). In Arizona at Tucson (H. and S.).

Calochromus perfaceta Say. Beulah (Skinner).

C. ruficollis Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.), Eagle Creek (T.).

Ellychnia flavicollis Lec. "New Mexico" (S.), San Ignacio (C.), Pecos (C.), Rio Ruidoso (T.).

E. californica Mots. Cloudcroft (K.).

E. corrusca L. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.), West Fork of Rio de las Casas (Sturgis).

Pyropyga fenestralis Melsh. Lone Mt., near Silver City (C.), Las Vegas (Gilbert Rosenwald), Pecos (C.), Albuquerque (W.).

P. decipiens Harr. Albuquerque (W.), Mesilla Valley (C.), Water Canon (S.).

P. minuta Lec. Roswell, identity not certain (C.).

Pyractomena angulata Say. Sacramento Mts. (K.).

Microphotus angustus Lec. Pecos, larva and imago (C.).

Mastinocerus texanus Lec. Mesilla (C.), Cloudcroft (V.).

Chauliognathus discus Lec. La Cueva, Organ Mts. (T.).

C. limbicollis Lec. Above Mescalero (Wooton), Ruidoso Creek (T.), Filmore Canon (C.), Las Vegas Hot Springs (Fenyes).

C. basalis Lec. Grant Co. (Howard), Raton (C.), Pecos (C.), Tierra Amarilla (Wheeler Surv.).

C. scutellaris Lec. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Mesilla Valley (C.), Roswell (C.), Dripping Spring, Organ Mts. (Martin D. Cockerell).

C. lewisii Cr. Water Canon (S.).

Podabrus piniphilus Esch. Gallinas Canon (S.).

P. lateralis Lec. Gallinas Canon (S.), Beulah (W. P. C.), top of Las Vegas Range (C.), Taos Peak, 13,000 ft. (cf. Leconte).

P. mexicanus Gorh. var. Sacramento Mts. (K.), Cloudcroft (V.).

Silis difficilis Lec. Beulah (C.).

Telephorus rectus Melsh. Gallinas Canon (S.).

T. flavipes Lec. Gallinas Canon (S.), Pecos (C.)., var.

T. ruficollis Lec. Beulah (C.), Cloudcroft (K.), Wootens (K.), Highrolls (V.).

T. tuberculatus Lec. Gallinas Canon (S.).

T. insipidus n. sp. Wootens (K.), Cloudcroft (K.).

T. sp. Sacramento Mts. (K.).

Polemius platyderus G. and H. Mesilla Valley (C.), Pecos (C.).

P. regularis n. sp. Sacramento Mts. (K.), Albuquerque (W.), Santa Rosa (K.).

Lobetus abdominalis Lec. Dimmit's Lake, Pecos Valley (C.).

Malthodes sp. Pecos (C.).

MALACHIDÆ.

Collops punctatus Lec. Water Canon (S.), Pecos, identity not certain (C.).

C. eximius Er. Gallinas Canon (S.), Pinos Altos (C.).

C. reflexus Lec. "Northern New Mexico" (cf. Leconte).

C. hirtellus Lec. Coolidge (W.), Taos Peak, 13,000 ft. (cf. Leconte).

C. bipunctatus Say. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Cloudcroft (K.), Lone Mountain (C.), Rio Ruidoso (T.), Beulah (C.), Highrolls (V.).

C. quadrimaculatus Fabr. Albuquerque (W.), Santa Fé Canon, a variety (S.), Coolidge (W.), Colora'o (C.), Pescao (Wheeler Surv.).

C. limbellus G. and H. Mesilla Park (C.), Roswell (C.).

C. vittatus Say. Albuquerque (W.). Mesilla, on *Solanum* (C.), Highrolls (V.), Las Vegas (C.).

Trophimus æneipennis Horn. Gallinas Canon (S.), Pecos (C.), Alamogordo (V.), Highrolls (V.).

Malachius montanus Lec. Pecos (Grabham).

Anthocomus ventralis Horn. Gallup (W.).

A. erichsoni var. Alamogordo (V.).

Pseudebæus sp. Sacramento Mts. (K.). Schwarz reports a new species of this genus from Tucson, Arizona (H. and S.).

Attalus basalis Lec. Gallinas Canon (S.).

A. morulus Lec. Santa Fé Canon (S.), Pecos, identity not certain (C.), Cloudcroft (C.).

A. rufiventris Horn. "New Mexico" (cf. Townsend).

A. difficilis Lec. Gallinas Canon (S.).

A. lobulatus Lec. Mesilla Valley (C.), Mesilla Park, identity doubtful (C.), Gallup (W.).

A. cælestinus Gorh. Gallup (W.), Coolidge (W.), Mesilla Valley (C.).

A. sp. Pecos (C.).

A. sp. Sacramento Mts. (K.).

A. sp. Santa Rosa (K.).

Trichochrous sparsus Csy. Near Rowe (C.), Pecos (C.), Soledad Canon (C.).

T. vittiger Csy. Alamogordo (V.), Cloudcroft (V.), Highrolls (V.).

T. suturalis Lec. Mesilla Valley (T.). [Probably an erroneous identification for *vittiger*.]

T. rufipennis Lec. Water Canon (S.).

T. mixtus n. sp. Alamogordo (V.).

T. hirtellus Lec. Alamogordo (V.).

T. bicoloripes n. sp. Las Vegas Hot Springs (B. and S.).

T. comatus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.), Mesilla Park (C.).

T. incultus n. sp. Alamogordo (V.), Mesilla Park (C.).

T. texanus Lec. Mesilla Valley (C.). [Somewhat doubtful.]

T. sophiæ n. sp. Soledad Canon, Organ Mts. (C.), Las Cruces (C.), Sacramento Mts. (K.).

T. placatus n. sp. Organ Mts. (C.).

T. similis n. sp. La Cueva, Organ Mts. (T.).

T. (Cradytes) serricollis Lec. "New Mexico and Colorado."

T. (Cradytes) prosternalis n. sp. Mescalero, on *Chrysothamnus graveolens glabratus* (C.).

Listrus senilis Lec. Gallinas Canon (S.), Mesilla Valley, on *Solidago* (C.), Pecos (C.), Wootens (K.), Cloudcroft (K.).

Dasytellus subovalis Casey. Alamogordo (V.), Highrolls (V.).

Leptorectura adspersa Casey. Alamogordo (V.).

Allonyx sculptilis Lec. Coolidge (W.).

Dasytes hudsonicus Lec. Magdalena Mts. (S), Ponil Canon (Miss Grace Eaton).

Mecomycter facetus Csy. Sacramento Mts. (K.), Thornton (Fenyes).

CLERIDÆ.

Cymatodera longicornis Lec. Santa Fé (C.), Pecos (C.).

C. puncticollis Bland. Walnut Creek (S.), Cloudcroft, identity doubtful (V.).

C. latefascia Schaeffer. La Trementina (Alice Blake).

C. cylindricollis Chevr. Walnut Creek (S.), Mesilla (C.), Roswell (C.).

C. belfragei Horn. Chaves (T.), Deming (Schwarz), also at Tucson, Arizona (H. and S.).

C. morosa Lec. Mesilla, det. Ashmead (C.), Silver City, iden. not certain (C.).

C. fuchsii Schaeffer. Tularosa, at light (T.).

Tarsostenus univittatus Rossi. Mesilla (C.).

Aulicus nero Spin. Water Canon (S.).

Trichodes ornatus Say. Gallinas Canon (S.), Monument Rock, Santa Fé Canon (Boyle), Beulah (C.), Grant Co. (Howard).

T. ornatus v. *tenellus* Lec. Gallinas Canon (S.), Beulah (C.).

T. apivorus Germ. Santa Fé Canon (S.).

T. simulator Horn. Albuquerque (W.). Santa Fé (C.), Embudo (C.), Pecos (C.). Usually on *Cleome*.

T. simulator v. *flavescens* Ckll., Bull. 28, N. M. Exp. Sta., p. 155. Santa Fé, on *Achillea* (C.).

Clerus spinolæ Lec. Walnut Creek (S.), Sacramento Mts., on *Yucca* (K.).

C. analis Lec. Water Canon (S.).

C. abruptus Lec. Mesilla Valley (C.), Gallup (W.), Las Vegas, July 21, identity doubtful (C.), Las Truchas, either this or very closely allied (C. Gerhardt). [Some or all of these are likely to be the form which I have called *corallinus*. Whether this is really a var. of *abruptus* or a distinct species as I have assumed is not certain.]

C. corallinus n. sp. Mesilla Park, on *Bigelovia* (C.), Las Vegas, on *Cleome* (C.), Fillmore Canon, Organ Mts. (T.), Thornton (Fenyes), Santa Fé (Fenyes).

C. cordifer Lec. Gallinas Canon (S.).

C. nigriventris Lec. Gallinas Canon (S.), Gallup (W.), Ruidoso Creek (T.), Sacramento Mts. (K.), Beulah (Skinner).

C. sphegeus Fabr. Gallinas Canon (S.), Santa Fé (C.), Coolidge (W.).

C. mœstus Klug. Gallinas Canon (S.), Santa Fé (Fenyes).

C. atriventris Lec. Gallinas Canon (S.).

C. undulatus Say. Gallinas Canon (S.).

Thanasimus undulatus. Beulah (Skinner), Ponil Canon (Miss Grace Eaton).

Hydnocera unifasciata Say (?) Las Vegas Hot Springs (B. and S.).

H. subfasciata Lec. Albuquerque (W.), Coolidge (W.), Santa Fé (Fenyes), Cloudcroft (V.).

H. subænea Spin. Gallinas Canon (S.).

H. pubescens Lec. Gallinas Canon (S.), Beulah (Skinner).

H. discoidea Lec. Walnut Creek (S.), Mesilla (C.), Silver City (cf. Townsend, Tr. Texas Acad., 1903).

H. cribripennis Fall. Alamogordo (V.).

H. cyanitincta Fall. Sacramento Mts. (K.).

H. sobrina Fall. Las Vegas Hot Springs (B. and S.), Cloudcroft (K.), near Wootens (K.).

Lebasiella discoidea Lec. Santa Fé Canon (S.).

Necrobia rufipes Fab. Water Canon (S.), Santa Fé Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Beulah (Skinner).

N. violacea L. Gallinas Canon (S.).

PTINIDÆ.

Niptus ventriculus Lec. Santa Fé (Fendler). This is the type locality.

Ptinus brunneus Duft. Albuquerque (C.).

P. sp. near interruptus. Santa Fé Canon (S.).

Ozognathus floridanus Lec. Highrolls (V.).

Cœlostethus alternatus Fall. West Fork of Rio de las Casas (Sturgis), Wootens (K.), Cloudcroft (K.).

Trypopitys sericeus Say. Walnut Creek (S.). [Probably an incorrect identification of *T. punctatus*.]

T. punctatus Lec. Silver City (C.), Las Vegas (C.), Santa Fé (type).

Petalium bistriatum. Mesilla (C.). [Identification needs verifying.]

Catorama conophilum Fall. Las Vegas, in cones of *Pinus edulis* (B. and S.).

C. nigripenne Fall. Deming (Hubbard and Schwarz).

C. validum Fall. Alamogordo (V.).

C. tumidum Fall. "New Mexico," Nat. Mus. coll.

C. longulum Fall. Las Vegas (B. and S.).

C. uniforme Fall. Las Cruces, March 4, in pith of dead sunflower stem (C.).

C. consobrinum Fall. "New Mexico," Nat. Mus. coll., Santa Fé (Fenyes). [The latter not typical.]

[C. gravis and C. obsoletus (*Hemiptychus*) have been previously recorded from Mesilla Valley by Prof. Cockerell, but both identifications are undoubtedly erroneous.]

Cænocara neomexicana Fall. Las Vegas (Hubbard and Schwarz).

Ptilinus lobatus Casey. Las Vegas Range, 9600 feet (C.), Walnut Creek (S.). [The latter identified as *ruficornis*, but doubtless in error.]

BOSTRYCHIDÆ.

Sinoxylon texanum Horn. "New Mexico" (cf. Townsend, Tr. Texas Acad. 1903).

S. quadrispinosum Lec. Mesilla Valley (C.), Tularosa, in wood supposed to be mesquite (C.).

Amphicerus bicaudatus Say. Near Roswell, doubtless introduced.

Dinoderus porcatus Lec. Albuquerque (W.), Gallup (W.).

D. substriatus Payk. Beulah (Skinner).

D. asperulus Casey, Jour. N. Y. Ent. Soc., 1898, p. 74. Fort Wingate (cf. Casey).

CIIDÆ.

Cis n. sp. Las Vegas Hot Springs (B. and S.).

Orthocis punctata Mellié. Las Vegas Hot Springs (B. and S.).

SPHINDIDÆ.

Sphindus americanus Lec. Las Vegas Hot Springs (B. and S.).

LUCANIDÆ.

Lucanus mazama Lec. "New Mexico" (Ulke), Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Pecos (C.), between Santa Fé and Fort Wingate (Wheeler Survey). Grant Co. (Howard), Las Vegas (C.). San Ildefonso (Wheeler Survey), Las Vegas Hot Springs (S. and B.).

Platycerus depressus Lec. Santa Fé Canon (S.), Beulah (C.).

SCARABÆIDÆ.

Canthon ebenus Say. Albuquerque (W.), Rincon (C.), Fort Wingate (Wheeler Survey), Tierra Amarilla (Wheeler Survey).

C. praticola Lec. Water Canon (S.), Santa Fé Canon (S.), Las Vegas (M. Cavanaugh), "Kansas and New Mexico" (LeConte, 1859).

C. puncticollis Lec. Deming (C.), Rincon (C.), Mesilla Park (C.), Alamogordo (K.).

C. lecontei Harold. Deming (C.).

C. lævis Drury. Gallinas Canon (S.), San Augustine (C.).

Copris moechus Lec. Walnut Creek (S.).

Phanæus quadridens Say. Walnut Creek (S.), Grant Co. (Howard), Las Vegas Hot Springs (S.).

P. difformis Lec. Grant Co. (Howard).

P. carnifex L. Gallinas Canon (S.), Water Canon (S.), Albuquerque (W.), Santa Fé (C.), Fort Wingate (Wheeler Survey).

Onthophagus coproides Horn. Water Canon (S.), Santa Fé Canon (S.), Rio Ruidoso (T.), San Ignacio (C.), Sacramento Mts. (K.), Pecos (C.), Las Vegas Hot Springs (S.).

O. hecate Panz. Albuquerque (W.), Gallinas Canon (S.), Santa Fé Canon (S.), Rio Ruidoso (T.), Pecos Canon. 7200-7500 ft. (C.), Alamogordo (K.), Fresnal Canon (K.).

O. janus var. aff. *striatulus*. La trementina (Alice Blake).

Ægialia blanchardi Horn. Pecos (C.).

Psammodius quinqueplicatus Horn. Albuquerque (W.), Mesilla Valley (C.), Colora'o (C.).

Rhyssemus cælatus Lec. Santa Fé Canon (S.).

R. californicus Horn. Santa Rosa (K.).

Atænius desertus Horn. Colora'o (C.), Deming (Schwarz). In Arizona at Tucson (H. and S.).

A. abditus Hald. Las Vegas Hot Springs (B. and S.).

A. inops Horn. Mesilla Valley (C.). In Arizona at Tucson (H. and S.).

A. læviventris Horn. Mesilla Valley (T.).

A. gracilis Mels. Albuquerque (W.), Thornton (Fenyes). Also Tucson, Arizona (H. and S.).

A. figurator Har. Water Canon (S.).

A. robustus Horn. Mesilla (C.).

A. strigatus Say. Mesilla Valley (C.).

A. cognatus Lec. Mesilla (C.), Colora'o (C.), Roswell (C.).

A. haroldi Steinh. Deming (Schwarz). In Arizona at Tucson (H. and S.).

Aphodius hamatus Say. "New Mexico;" Santa Fé (Fenyes), Santa Fé Canon (*hyperboreus*) (S.).

A. denticulatus Hald. "New Mexico."

A. crassulus Horn. Santa Fé Canon (S.). [Quite surely an erroneous identification for the following species.]

A. crassuloides n. sp. Common at Cloudcroft and Wootens (K.).

A. aleutus Esch. Truchas Peak, above timber line (W. P. C.), Beulah (C.), *ursinus* Mots., Gallinas Canon (S.), Santa Fé Canon (S.).

A. fœtidus Fab. "New Mexico."

A. duplex Lec. Water Canon (S.).

A. ruricola Melsh. Water Canon (S.), Santa Fé Canon (S.).

A. anthracinus Lec. Top of Las Vegas Range, 11,000 ft. (C.), Beulah (Grabham), Sacramento Mts. (K.).

A. granarius L. Santa Fé (C.), Albuquerque (W.), Mesilla Valley (C.), Las Vegas (C.), Pecos (C.), Las Vegas Hot Springs (B. and S.), Alamogordo (V.).

A. vittatus Say. Santa Fé Canon (S.), Albuquerque (W.). Coolidge (W.). Sacramento Mts. (K.), Placita (C.), Pinos Altos (C.), Rio de las Casas (Sturgis), Thorton (Fenyes).

A. lividus Oliv. Albuquerque (W), Thornton (Fenyes), common at Santa Rosa and occasional at Alamogordo and Wootens (K).

A. rudis Lec. Pecos, captured by *Asilus angustifrons* Will (C.). Both the fly and beetle were determined by Coquillet.

A. umbricollis n. sp. Albuquerque (W.).

A. concavus Say. Albuquerque (W.), Mesilla Valley (C.), Silver City (C.), Pecos (C.), Santa Fé (Fenyes).

A. consentaneus Lec. Walnut Creek, a variety (S.), Albuquerque (W.), Pinos Altos (C.), Silver City (C.), Coolidge (W.).

A. luteolus Horn. Pinos Altos (C.), Santa Fé (Fenyes).

A. coloradensis Horn. Gallinas Canon (S.), Water Canon (S.), Coolidge (W.), Gallup (W.), Pecos (C.), Santa Fé (Fenyes).

A. pumilus Horn. Aztec (Hayward), Santa Fé (Fenyes), "Common at Alamogordo. Described from a single specimen taken near Las Cruces, N. M., over 20 years ago by Chas. Dury" (K.).

A. plutonicus n. sp. South Fork, Eagle Creek, White Mts., about 8100 feet (Townsend).

A. cruentatus Lec. John's Canon (C.), Beulah (Skinner), Santa Fé (Fenyes).

A. scabriceps Lec. Pecos (Grabham).

A. subtruncatus Lec. Gallinas Canon (S.).

A. n. sp. (*fide* Horn and Wickham). Mesilla Valley (C.). [I have not seen this.]

Ochodæus pectoralis Lec. Near Canon Blanco (cf. LeConte).

O. gnatho n. sp. Mesilla (C.).

O. simplex Lec. Santa Fé (C.), Ruidoso Creek (T.); *complex*, near Canon Blanco (LeConte).

O ulkei Horn. Gallinas Canon (S.).

O. biarmatus Lec. Near Canon Blanco (LeConte), Albuquerque (W.), Deming (Schwarz), Pecos (C.), Roswell (C.), Arrogo, near La Luz (T.).

O præsidii Bates. Albuquerque (S.).

O. mandibularis Linell. Las Cruces (cf. Linell), Deming (Schwarz), Albuquerque (S.).

O. nimius n. sp. Mesilla (C.).

O. striatus Lec. Walnut Creek (S.).

O. sparsus Lec. Near Canon Blanco (LeConte), Mesilla, identity doubtful (C.), Thornton (Fenyes).

Bolboceras lazarus Fab. Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (C.), Embudo (C.), Santa Fé (Wheeler Survey).

Bolbocerosoma farctum Fab. Water Canon (S.).

Trox scutellaris Say. Water Canon (S.). Albuquerque (W.), "from Platte River to Santa Fé (LeConte, 1859).

T. suberosus Fabr. Water Canon (S.), Albuquerque (W.), La Trementina (Alice Blake), Santa Rosa (K.).

T. punctatus Germ. Water Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Lone Mt., near Silver City (C.).

T. tuberculatus DeG. Las Vegas Hot Springs (C.), Pecos (C.).

T. sonoræ Lec. Gallinas Canon (S.), Water Canon (S.), Lone Mt., near Silver City (C.), Cloudcroft (K.), Santa Fé (Fenyes).

T. atrox Lec. Santa Fé Canon (S.), Coolidge (W.), Pecos (C.).

T. alternans Lec. Santa Fé Canon (S.).

Glaresis inducta Horn. Deming (Schwarz).

Hoplia laticollis Lec. Gallinas Canon (S.), Pecos Canon, 7200–7500 ft. (C.).

Dichelonycha backii Kirby. Pecos Canon, 7200–7200 ft. (C.),

D. testaceipennis n. sp. "Occurs on scrub oak, young pines, wild roses and willow from Cloudcroft down to Wootens, 7000 ft. (K.).

D. pusilla Lec. Coolidge (W.). [Probably an incorrect identification of the following species.]

D. sulcata Lec. Pecos (C.).

Serica vespertina Gyll. Gallinas Canon (S.), Trout Spring, identity not certain (C.).

S. serotina Lec. Walnut Creek (S.).

S. curvata Lec. Albuquerque (W.), Walnut Creek (S.), Pescao (Wheeler Surv.).

S. elongatula Horn. Las Vegas Hot Springs (S. and B.).

S. mixta Lec. (?) Rio Ruidoso (T.).

S. n. sp. ? aff. elongatula. Dripping Spring, Organ Mts. (C.).

Macrodactylus uniformis Horn. Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (T.), Sacramento Mts. (K.), Rio Ruidoso (T.), Rociada (C.), Lone Mtn. (C.), Las Vegas Hot Springs (S. and B.).

*Diplotaxis puberula Lec. Silver City (C.).

D. brevicollis Lec. San Geronimo (W. P. Cockerell and M. Cooper), Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Pecos (C.). San Ildefonso (Wheeler Surv.), Cloudcroft (K.), Pescao (Wheeler Surv.), Apache Spring (T.), Eagle Creek (T.), Las Vegas Hot Springs (C.), (S. and B.), Magdalena Mts. (S.).

D. obscura Lec. Water Canon (S.), Las Vegas Hot Springs (S. and B.), Pecos (C.), Socorro Co. (S.).

D. truncatula Lec. Rincon, identity doubtful (cf. Townsend).

D. carbornata Lec. Albuquerque (W.), Water Canon (S.), Santa Fé (C.), Mesilla Valley (C.), Colora'o (C.).

D. atratula Lec. Mesilla (C.). In Arizona at Tucson (H. and S.)

D. punctata Lec. Albuquerque (W.), Roswell (C.).

D. subangulata Lec. Deming (Schwarz), Albuquerque (S.). This is probably not the true *subangulata*.

D. pacata Lec. Albuquerque (W.), Mesilla (C.), Rincon (C.), Colora'o (C.).

D. haydenii Lec. Gallinas Canon (S.), Rio de las Casas (Sturgis), near Las Vegas Hot Springs (S.).

D. innoxia Lec. Las Vegas (Martin Cockerell), Las Vegas Hot Springs, identity doubtful (B. and S.).

D. n. sp. La Trementina (Alice Blake), Magdalena Mts. (S.).

D. n. sp. La Trementina (Alice Blake).

*The genus *Diplotaxis* is greatly in need of revision; it is probable that some of the older records here given are based on erroneous identification.

D. n. sp. Dripping Spring, Organ Mts. (C.).

D n. sp. Pecos (C.).

D. n. sp. Pecos (C.).

Lachnosterna lanceolota Say. Santa Fé (C.), Las Vegas (C.), Gallinas Canon (S.), Water Canon (S.).

L. torta Lec. "New Mexico" (Ulke coll.).

L. affinis Lec. Gallinas Canon (S.).

L. longitarsus Say. Albuquerque (W.).

L. micans Knoch. Gallinas Canon (S.).

L. fusca Fröh. Gallinas Canon (S.), Las Vegas (C.).

L. dubia Smith. Albuquerque (W.).

L. hirsuta Knoch. Gallinas Canon (S.).

L. vetula Horn. Las Vegas Hot Springs (B. and S.).

L. ignava Horn. "New Mexico" (S).

L. crinita Burm. Albuquerque (W.), Mesilla (C.).

L. tristis Fab. Las Vegas (C.), Las Vegas Hot Springs, identity doubtful (C.), Las Vegas Hot Springs (B. and S.).

L. lenis Horn. Albuquerque (W.).

Phytalus debilis Horn. Walnut Creek (S.).

Listrochelus disparilis Horn. "New Mexico" (Horn), Continental Divide, Tenaja (T.), Cloudcroft (K.), Las Vegas Hot Springs (S. and B.).

L. scoparius Lec. Continental Divide, Tenaja (T.). In Arizona at Tucson (H. and S.).

L. mucoreus Lec. "New Mexico" (cf. Horn); *texanus*, Pescoa (Wheeler Survey).

L. opacicollis Horn. "New Mexico" (cf. Horn).

L. sociatus Horn ? Alamogordo (V.).

L. falsus Lec. Gallinas Canon (S.).

L. fimbripes Lec. "New Mexico" (cf. Horn).

Polyphylla hammondi Lec. Albuquerque (W.), Mesilla (C.), Colora'o (C.).

P. decemlineata Say. Santa Fé (C.), Gallinas Canon (S.), Rio Ruidoso (T.), Pescao (Wheeler Surv.), La Trementina (Alice Blake), Pecos (C.).

P. diffracta Casey. "New Mexico."

Thyce squamicollis Lec. Albuquerque (W.). The type was a female from Albuquerque, collected by Dr. T. C. Henry.

Anomala binotata Gyll. Soledad Canon, Organ Mts. (T.).

A. undulata Melsh. "New Mexico."

A. lurida Fabr. "New Mexico."

A. cavifrons Lec. Mesilla (C.), Thornton (Fenyes).

A. carinifrons Bates. Deming (Schwarz).

A. antennata Schaeffer. "New Mexico."

Strigoderma arboricola Fabr. Walnut Creek (S.).

Pelidnota lugubris Lec. Deming (Schwarz). In Arizona at Tucson (H. and S.).

Plusiotis gloriosa Lec. Water Canon (S.), Walnut Creek (S.), Grant Co. (Howard).

P. lecontei Horn. Walnut Creek (S.).

Cyclocephala immaculata Oliv. Water Canon (S.) Albuquerque (W.), Mesilla Valley (C.), Mesilla (C.), Deming (Schwarz), Alamogordo (K.).

C. villosa Burm. La Trementina (Alice Blake).

C. dimidiata Burm. In flowers of *Datura meteloides*. Mesilla (C.), Selden (C.), Alamogordo (K.).

Ancognatha manca Lec. Walnut Creek (S.).

Ligyrus gibbosus DeG. Albuquerque (W.), Water Canon (S.), Mesilla Valley (C.). Deming (Schwarz). Colora'o (C.), Santa Fé (Wheeler Survey), Alamogordo (K.).

L. ruginasus Lec. Grant Co. (Howard).

Aphonus pyriformis Lec. Santa Fé (C.), Gallinas Canon (S.), Pecos (C.), Las Vegas Hot Springs (S. and B.).

A. tridentatus Say. "New Mexico."

Cheiroplatys clunalis Lec. Las Vegas (Gilbert Rosenwald), Sacramento Mts. (K.), Albuquerque (W.), Santa Fé Canon (S.), Walnut Creek (S.), Cloudcroft (K.).

C. verticalis Fall. Las Vegas (Mrs. Joshua Raynolds).

Aphonides dunnianus Rivers. Mesilla Valley (C.).

Xyloryctes satyrus Fabr. Walnut Creek, a variety (S.), Grant Co. (Howard), Las Vegas Hot Springs (S. and B.).

Strategus julianus Burm. Grant Co. (Howard). In Arizona at Tucson (H. and S.)

S. cessus Lec. Water Canon (S.), Walnut Creek (S.), La Trementina (Alice Blake), Las Vegas Hot Springs (S. and B.).

Dynastes tityus L. Grant Co. (Howard), Ojo Caliente, Grafton (cf. Chittenden).

D. grantii Horn. Grant Co. (Howard), Cloudcroft (K.), Colora'o (Jacoby), Silver City (S.).

Phileurus valgus Fabr. "New Mexico" (cf. LeConte, 1859; also Townsend). LeConte says that Brazilian specimens do not differ).

Allorhina mutabilis Gory. Mesilla Valley (C.), Socorro (Eaton), Grant Co. (Howard), Wootens (K.), Water Canon, as *nitida* (S.).

Gymnetis cretacea Lec. "New Mexico" (cf. Snow).

Euphoria verticalis Horn. La Cueva, Organ Mts. (T.).

E. kernii Hald. Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (C.), Las Truchas (Clara Gerhardt), Las Vegas Hot Springs (S. and B.).

E. melancholica Gory. "New Mexico" (cf Townsend).

E. fulgida Fabr. Gallinas Canon (S.), near San Ignacio (S).

E. inda L. Santa Rosa (K.), Santa Fé (C.), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Organ Mts. (C.), Las Truchas (Clara Gerhardt), Santa Fé Canon (S.). Grant Co. (Howard), Las Vegas (C.), Las Vegas Hot Springs (S. and B.), Alamogordo (V.).

Cremastochilus crinitis Lec. Coolidge (W.), Grant Co. (Howard).

C. knochii Lec. Sta. Fé (C.), Las Vegas (C.), Sta. Fé Canon (S.), Pecos (C.).

C. castaneæ lecontei Westwood. Placita, in nest of *Formica* (C.).

Trichius texanus Horn. Rio Ruidoso, on *Carduus*, 6400 ft. (Wooton), Cloudcroft (V.), Wootens, on thistles (K.).

T. affinis Gory. Gallinas Canon (S.), Beulah (C.).

SPONDYLIDÆ.

Parandra brunnea Fabr. Tierra Amarilla (Wheeler Surv.).

Spondylis upiformis Mann. Walnut Creek (S.).

CERAMBYCIDÆ.

Ergates spiculatus Lec. Gallinas Canon (S.), Las Vegas Hot Springs (Meeske), Pecos (E. L. Hewett), Cloudcroft (K.), Las Vegas (Gilbert Rosenwald). The Las Vegas specimen is of the form called *marmoratus* Ckll. Casey has applied the name *neomexicanus* to certain New Mexico specimens.

Derobrachus geminatus Lec. Water Canon (S.), Mesilla Valley (T.), Albuquerque (Henry). The last is the type locality.

Prionus pocularis Dalm. Albuquerque (W.), Santa Fé (C.).

P. californicus Mots. Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (T.), Grant Co. (Howard), Las Vegas Hot Springs (Schwarz and Barber). The variety *curvatus* Lec. was described from near Santa Fé.

P. fissicornis Hald. "New Mexico" (cf. LeConte, 1859).

P. palpalis Say. Coolidge (W.), Santa Fé (Fenyes).

Homæsthesis integer Lec. Cloudcroft (K.).

H. emarginatus Say. Gallinas Canon (S.), Coolidge (W.), Las Vegas (C.), "New Mexico" (LeConte, 1859).

Tragosoma harrisii Lec. Gallinas Canon (S.), Eagle Creek (T.), Sacramento Mts. (K.).

T. spiculum Casey (= *harrisii*, according to Horn), "New Mexico" (Casey).

T. sodalis Casey. Cloudcroft (K.).

T. parvicollis Casey. Cloudcroft (K.).

Asemum atrum Esch. Pecos (C.), Ponil Canon, 9650 ft. (Miss Grace Eaton).

A. mœstum Hald. Sacramento Mts. (K).

Nothorhina aspera Lec. Sacramento Mts. (K.).

Criocephalus productus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.).

C. agrestis Kirby. Between Santa Fé and Ft. Wingate (Wheeler Survey), Pescao (Wheeler Surv.).

C. asperatus Lec. Santa Fé (C.), Albuquerque (W.), Cloudcroft (K.), Coolidge (W.), Gallup (W.), Las Vegas (C.). Described from "Kansas and New Mexico."

C. obsoletus Rand. Coolidge (W.), Gallup (W.).

C. nubilus Lec. Las Vegas Hot Springs (Schwarz and Barber).

Tetropium velutinum Lec. Gallinas Canon (S.).

T. cinnamopterum Kirby. Gallinas Canon (S.), Beulah (Skinner).

Phymatodes dimidiatus Kirby. Gallinas Canon (S.).

Callidium antennatum Newm. Walnut Creek (S.).

C. janthinum Lec. Coolidge (W.), Las Vegas (C.), La Trementina (Alice Blake).

C. hirtellum Lec. Gallinas Canon (S.).

C. vile Lec. Coolidge (W.).

Eburia haldemani Lec. Mesilla, in the Casad orchard, under band on apple tree; det. Gahan (C.).

Romaleum simplicicolle Hald. Grant Co. (Howard).

R. simplicicolle v. *procerum* Lec. Las Vegas (Gilbert Rosenwald).

Elaphidion mœstum Lec. Mesilla (C.).

Rhopalophora lævicollis Lec. Rio Ruidoso (T.), Mt. Park, six miles below Cloudcroft (K.).

R longipes Say. Gallinas Canon (S.), Santa Fé Canon (S.), Rio Ruidoso, on *Rhus*, 6600 ft. (Wooton).

R. meeskei Casey. Rociada (C.), Beulah (C.), Pecos (C.), Las Vegas Hot Springs (S. and B.).

Elytroleptus rufipennis Lec. "New Mexico."

Dendrobias quadrimaculatus Dup. Deming (S.), Mesilla Valley (C.).

Stenaspis verticalis Serv. Mesilla Valley (T.).

S. solitaria Say. Deming (S.), Mesilla Valley (C.). First found in New Mexico by Dr. Wislizenus.

Tragidion annulatum Lec. Gallinas Canon (S.), Grant Co. (Howard), Mt. Park, on thistles (K.).

T. coquus L. Rociada (C.).

T. coquus v. *fulvipenne* Say. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Dripping Spring, Organ Mts. (C.).

T. armatum Lec. Mesilla Valley (T.).

Æthecerus latecinctus Horn. Mesilla Valley (T.).

Amannus vittiger Lec. "New Mexico."

Batyle ignicollis Say. Gallinas Canon (S.), Water Canon (S.), Pecos (C.).

B. suturalis Say. Gallinas Canon, as *pearsalli* Bland (S.), Santa Fé (C.). Mesilla Valley (T.), Beulah (Skinner), Chicorico Canon, near Raton (C.), Mesilla Park (C.), Las Vegas Hot Springs (S. and B.). This species has a vertical range of over 4000 ft.

Schizax senex Lec. Mesilla Valley (T.).

Tylosis maculata Lec. Santa Fé (C.), Albuquerque (W.), Socorro (S.), Las Cruces (C.), Organ Mt. (T.), Sabinal (T.), Grant Co. (Howard). The vertical range is 3200 ft., but it is rare at the higher levels. It was first found in New Mexico by Dr. Wislizenus.

Crossidius intermedius Ulke. Socorro (S.), Mesilla Valley (T.).

C. pulchellus Lec. La Cueva, Organ Mts. (T.), Organ (C.), Mesilla Valley (C.), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Las Vegas (C.). Mescalero (C.). Vertical range about 3000 ft.

C. humeralis Lec. Roswell (C.).

C. discoideus Say. Socorro (S.).

C. longipennis Casey. Albuquerque (W.).

Sphænothecus suturalis Lec. Deming (S.), Mesilla Valley (C.).

Stenosphenus lepidus Horn. Mesilla, on *Sphæralcea fendleri* var. *lobata*, July 23 (C.).

Cyllene pictus Drury. "New Mexico."

C. decorus Oliv. Albuquerque, a variety (W.).

C. decorus var. *infaustus* Lec. Water Canon (S.).

Calloides nobilis Say. Gallinas Canon (S.).

Xylotrechus sagittatus Germ. "New Mexico" (Wheeler Surv.), Gallinas Canon (S.), Las Vegas Hot Springs (S. and B.).

X. undulatus Say. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah (C.).

X. obliteratus Lec. Ponil Canon, 9650 ft. (Miss Grace Eaton).

Neoclytus irroratus Lec. Grant Co. (Howard).

N. muricatulus Kirby. Santa Fé (C.), Beulah (Beyer).

N. erythrocephalus Fabr. Mesilla Valley (C.).

N. approximatus Lec. Alamogordo, a variety (V.).

Rhagium lineatum Oliv. Gallinas Canon (S.), Grant Co. (Howard), San Geronimo, under bark of pine (W. P. Cockerell and Mary Cooper), Ponil Canon (Miss Grace Eaton).

Toxotus vestitus Hald. Sacramento Mts. (K.).

T. trivittatus Say var. On scrub oak, Cloudcroft (K.).

Pachyta liturata Kirby. Gallinas Canon (S.), Grant Co. (Howard), Beulah (Skinner), top of Las Vegas Range (C.), Tierra Amarilla (Wheeler Surv.), Ponil Canon (Miss Grace Eaton).

Acmæops longicornis Kirby. Gallinas Canon (S.).

A. proteus Kirby. Beulah (C.), Cloudcroft, a variety (K.).

A. pratensis Laich. Gallinas Canon (S.), Coolidge (W.), top of Las Vegas Range (C.), Beulah (C.), Carriage House, Gallinas Canon (Miss F. Beschle).

Strangalia sexnotata Hald. Gallinas Canon (S.), Rio Ruidoso (T.).

S. montana Casey. "New Mexico."

Typocerus zebratus Fabr. Gallinas Canon (S.).

T. velutinus Oliv. Gallinas Canon (S.).

T. brunnicornis Lec. Gallinas Canon (S.).

T. sinuatus Newm. Gallinas Canon (S.), Las Vegas, identity doubtful (C.).

Leptura propinqua Bland. Top of Las Vegas Range (C.), Beulah (W. P. C.), Sacramento Mts. (K.).

L. subargentata Kirby. Ponil Canon, 9650 ft. (Miss Grace Eaton).

L. nigrella Say. Gallinas Canon, a variety (S.).

L. carbonata Lec. Gallinas Canon (S.).

L. canadensis Fabr. Coolidge (W.), Las Vegas Hot Springs (S. and B.), Cloudcroft, a variety (K.).

L. canadensis v. *cribripennis* Lec. Gallinas Canon (S.), Beulah (W. P. C.), Rio Ruidoso, on *Rhus* (T.), Tierra Amarilla (Wheeler Survey).

L. sanguinea Lec. Gallinas Canon (S.), Beulah (C.).

L. chrysocoma Kirby. Gallinas Canon (S.), Coolidge (W.), Santa Fé (C.), Beulah (C.), Pecos (C.), Las Vegas Hot Springs (S. and B.).

L. nigrolineata Bland. Gallinas Canon (S.), top of Las Vegas Range (C.).

L. cockerelli n. sp. Beulah (C.).

L. mutabilis Newm. Gallinas Canon (S.).

L. aspera Lec. Grant Co. (Howard), top of Las Vegas Range (C.).

Monilema annulatum Say. Gallinas Canon (S.), Pecos (C.).

M. appressum Lec. Santa Fé (Fenyes). Dr. Wislizenus discovered it in New Mexico.

M. lævigatum Bland. Socorro (S.), Santa Fé (Fenyes).

M. crassum Lec. Gallinas Canon (S.), Canon four miles above Pecos (C.).

Psenocerus tristis Casey. "New Mexico." This is doubtful, both as to locality and validity.

Monohammus titillator Fabr. Coolidge (W.).

M. maculosus Hald. Santa Fé (C.), Gallinas Canon (S.), Las Vegas (C.), Beulah (Skinner), La Trementina (Alice Blake), Santa Fé Canon (S.), Rio Ruidoso (T.), between Santa Fé and Ft. Wingate (Wheeler Surv.), Tierra Amarilla (Wheeler Surv.), Beulah (Beyer).

M. scutellatus Say. Gallinas Canon (S.), Tierra Amarilla (Wheeler Surv.), Ponil Canon, 9650 ft. (Miss Grace Eaton).

Leptostylus biustus Lec. Walnut Creek (S.).

L. pini Schaef. Las Vegas Hot Springs (S. and B.).

Dectes spinosus Say. Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Mesilla Valley (C.), Deming (C.), Las Vegas Hot Springs (S. and B.).

Hyperplatys maculatus Hald. Gallinas Canon (S.).

Lepturgoides pini Schaef. Las Vegas Hot Springs (S. and B.).

Acanthocinus obliquus Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Beulah (Skinner), Rio Ruidoso (T.), Rowe (A. F. Benedict), Las Vegas Hot Springs (S. and B.), Ponil Canon (Miss Grace Eaton).

A. spectabilis Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Las Vegas (C.), Beulah (Skinner). Described as *Ædilis spectabilis* from Fort Union (Sibley).

Pogonocherus mixtus Hald. Gallinas Canon (S.), Santa Fé Canon (S.), Sacramento Mts. (K.), Sierra Blanca, 10,000 ft. (E. O. Wooton).

Oncideres putator Thom. Arroyo, near La Luz (T.).

Ataxia crypta Say. "New Mexico" (cf. Townsend). In Arizona at Tucson (H. and S.).

Mecas pergrata Say. Gallinas Canon (S.), Santa Fé (C.), Pecos (C.).

M. n. sp. ? Las Vegas Hot Springs (C.).

Tetraopes rubrocinereus Thoms. (*discoidens* Lec.). Gallinas Canon (S.), Santa Fé (C.), Lone Mtn. (C.), Las Vegas Hot Springs (S. and B.).

T. femoratus Lec. Santa Fé (C.), Gallinas Canon (S.), Grant Co. (Howard), Wootens (K.), Las Vegas (C.), Eagle Creek (T.), Rio Ruidoso (T.), Thornton (Fenyes), Las Vegas Hot Springs (S. and B.).

T. femoratus v. *basalis* Lec. Gallinas Canon (S.), Pecos (C.).

T. canescens Lec. Albuquerque (W.), Gallinas Canon (S.), Socorro (S.), Mesilla (C.).

CHRYSOMELIDÆ.

Aulacoscelis purpurea Horn. Las Vegas Hot Springs (B. and S.).

Orsodachna atra Ahr. Walnut Creek (S.), top of Las Vegas Range (C.), Sacramento Mts. (K.), Beulah (Dr. M. Grabham), Beulah, a variety (C.), Cloudcroft (V.).

O. atra v. *childreni* Kirby. Gallinas Canon (S.).

Zeugophora abnormis Lec. Gallinas Canon (S.), Beulah (C.), Cloudcroft (V.).

Z. consanguinea Croth. Gallinas Canon (S.).

Z. scutellaris Suffr. Santa Fé (Fenyes).

Syneta carinata Mann. Top of Las Vegas Range (C.).

Lema concolor Lec. Las Vegas (S.), Eagle Creek (T.).

L. trilineata Oliv. Gallinas Canon (S.), Mesilla Park, on *Datura* (C.), Santa Fé, on *Datura* (C.), Alamogordo (V.). The variation called *trivirgata* Lec. is included; it was described from Santa Fé (Fendler).

L. nigrovittata Guér. Albuquerque (W.), West Fork of Rio de las Casas (Sturgis), Ruidoso Creek, a var. ? (T.), Santa Fé (Fenyes).

Anomœa militaris Lec. Sacramento Mts. (K.).

Euryscopa lecontei Crotch. Deming (C.), Las Cruces (C.), Sacramento Mts. (K.), Alamogordo (V.).

E. vittata Lec. Engle (Miss Nora Newberry.)

Coscinoptera axillaris Lec. Mesilla Valley (T.), La Cueva, Organ Mts. (T.), Pecos, on flowers of *Clematis ligusticifolia* (C.), Cloudcroft (V.), Highrolls (V.).

C. dominicana Fabr. Mesilla Valley (C.), Las Vegas Hot Springs (W. P. C.).

C. vittigera Lec. The "Gap" between San Ignacio and Las Vegas, in nest of *Formica* (C.), Beulah (C.), Cloudcroft (V.).

Megalostomis pyropyga Lac. "New Mexico" (cf. Ulke).

Babia quadriguttata Oliv. Gallinas Canon (S.), Pecos Canon, 7200–7500 ft. (C.), Santa Fé (Fenyes).

B. quadriguttata v. *tetraspilota* Lec. Walnut Creek (S.), Beulah (Skinner).

Saxinis sonorensis Jacoby ? Alamogordo (V.).

Urodera crucifera Lec. Gallinas Canon (S.), Pecos (C.), Santa Fé (Fenyes).

Chlamys plicata Fabr. Mesilla Valley, on *Larrea* (C.), Sacramento Mts. (K.).

C. sp. Alamogordo (V.).

Exema conspersa Mann. Alamogordo (V.), Highrolls (V.).

Cryptocephalus quadrimaculatus Say. Beulah (C.), Rio Ruidoso (T.), Sacramento Mts. (K.), Pecos (C.), Cloudcroft (V.).

C. quadruplex Newm. Beulah (Skinner).

C. quadruplex v. *quadriguttulus* Suffr. Gallinas Canon (S.), Sacramento Mts., det. Leng (K.).

C. atrofasciatus Jac. Las Vegas Hot Springs (B. and S.), Cloudcroft (K.), beaten from pine by Knaus.

C. amatus Hald. Walnut Creek (S.).

C. confluens Say. Santa Fé (Fenyes), Mesilla Park (C.).

C. spurcus Lec. Mesilla Park, on *Larrea* (C.).

C. venustus Fabr. Santa Rosa (K.).

C. arizonensis Schaef. Rio Ruidoso (T.).

Griburius montezumæ Suffr. Santa Fé (Fenyes). In Arizona at Tucson (H. and S.).

Pachybrachys xanti Cr. Alamogordo (V.). In Arizona at Tucson (H. and S.).

P. donneri Cr. Pecos, identity not certain (C.).

P. morosus Hald. San Ignacio (C.), Cloudcroft (K.).

P. litigiosus Suffr. Gallinas Canon (S.).

P. abdominalis Say. Walnut Creek, a variety (S.).

P. dubiosus Lec. Gallinas Canon (S.).

P. pubescens Oliv. Gallinas Canon (S.), Pecos (C.), Santa Fé (Fenyes).

P. tridens Melsh. Gallinas Canon (S.), Beulah (C.).

P. lustrans Lec. Beulah (cf. Skinner), Cloudcroft (K.).

P. subvittatus Lec. Gallinas Canon (S.).

P. atomarius Melsh. Gallinas Canon (S.), Mesilla Valley (T.), Coolidge, identity not certain (W.), Beulah (Skinner). This gives the species a vertical range of over 4000 ft.

P. hepaticus Melsh. Gallinas Canon (S.), Truchas Peak (W. P. Cockerell).

P. sp. Sacramento Mts. (K.).

P. sp. Sacramento Mts. (K.).

P. sp. Colora'o (C.).

P. sp. Lone Mtn. (C.).

P. sp. Eagle Creek (T.).

P. sp. Pecos (C.).

P. sp. Top of Las Vegas Range, 11,000 ft. (C.).

P. sp. Cloudcroft (K.).

Diachus auratus Fabr. Gallinas Canon (S.), Walnut Creek (S.), Cloudcroft (K.), Highrolls (V.), Alamogordo (V.).

D. æruginosus Lec. Sacramento Mts. (K.), Cloudcroft, identity doubtful (S.).

Adoxus obscurus v. *vitis* Fabr. Head of Dailey Canon (C.), Beulah (Skinner).

Xanthonia decemnotata Say. Beulah (Skinner), Gallinas Canon (S.), Santa Fé Canon (S.), Cloudcroft, on pines (K.), Las Vegas Hot Springs (B. and S.).

X. villosula Melsh. Sacramento Mts. (K.), Las Vegas Hot Springs (B. and S.).

Myochrous denticollis Say. Mesilla Park (C.).

M. squamosus Lec. Coolidge (W.).

Graphrops pubescens Melsh. Sacramento Mts. (K.).

G. marcassita Cr. Santa Fé Canon (S.).

G. nebulosus Lec. Las Vegas (C.).

Typophorus canellus Fabr. Dripping Spring, Organ Mts. (C.), Pecos (C.).

T. canellus v. *quadriguttatus* Lec. Wiegand Ranch, near Las Vegas (C.), Las Valles (C.), Romeroville (C.).

T. canellus v. *aterrimus* Oliv. Gallinas Canon (S.).

Metachroma aterrimum Horn. Luna (W.), Santa Fe (Gissler), Arroyo, near La Luz (T.).

M. interruptum Say. Mesilla, a variety (C.).

M. angustulum Cr. Mesilla Valley (C.).

Chrysochus auratus Fabr. Rociada (C.), Gallinas Canon (S.), Socorro (C.), Pecos (C.).

C. cobaltinus Lec. Mesilla Park (C.), "New Mexico" (Wheeler Survey).

Colaspis brunnea Fabr. Mesilla (C.), Gallinas River (C.).

C. brunnea v. *flavida* Say. Mesilla, on grape vine (C.), Colora'o (C.).

Metaxyonycha circumcincta Horn. "New Mexico" (cf. Horn).

Colaspoides viridimicans Horn. "New Mexico" (W.). Several specimens, June 13, near Conant, on the Rock Island Railroad, on a tall plant with narrow leaves and a small red blossom, growing along the ditch at the edge of the road bed (K.). Mr. Knaus's brief description of the plant would agree well with *Sphæralcea cuspidata*.

Nodonota tristis Oliv. Highrolls (V.).

N. puncticollis Say var., differs by its more sparsely punctate and more shining thorax, Pecos (C), San Ignacio (C.).

Labidomera clivicollis v. *rogersii* Lec. Roswell (C.).

Leptinotarsa rubiginosa Rog. Water Canon (S.), Grant Co. (Howard).

L. haldemani Rog. Dripping Spring, Organ Mts., det. Schwarz (C.).

L. lineolata Stal. San Augustine, E. base of Organ Mts. (C.).

L. melanothorax Stal.* "New Mexico" (S., cf. Horn).

L. decemlineata Say. Albuquerque (W.), Mesilla (C.), Coolidge (W.), Luna (W.), Deming (Schwarz).

Zygogramma exclamationis Fab. Albuquerque (W.), Gallinas Canon (S.), Mesilla Valley (C.), Rancah (T.), Santa Fé (Fenyes).

Z. conjuncta Rog. Gallinas Canon (S.), Coolidge (W.).

Z. conjuncta v. *pallida* Bland. "New Mexico" (Fall).

* Mr. W. L. Tower writes under date March 5, 1907: "Snow's case of *L. melanothorax* is utterly wrong. I have seen the specimen (Mus. Comp. Zool.) and it is not *melanothorax* but a variation of 10-*lineatus* which occurs rarely, and which I have reared in an experiment."

Z. continua Lec. Gallinas Canon (S.), Beulah (C.), Cloudcroft (V.).

Z. suturalis Fabr. Gallinas Canon (S.).

Z. heterothecæ Linell. Las Vegas, det. Wickham (C.). There is no *Heterotheca* in this region.

Z. tortuosa Rog. Deming, on *Ephedra* (C.), Loue Mtn. (C.), Eagle Creek (T.), Colora'o (C.).

Calligrapha scalaris Lec. Walnut Creek (S.).

C. multipunctata Say. Gallinas Canon (S.), Pecos (C.).

C. dislocata Rog. Mesilla Valley (T.).

C. sigmoidea Lec. Beulah (Skinner).

C. serpentina Rog. Albuquerque (W.), Mesilla Valley (C.), Fillmore Canon, Organ Mts. (T.), San Augustine (Wooton).

C. sylvia Stal. Grant Co. (Howard).

Chrysomela flavomarginata Say. Sacramento Mts. (K.), Cloudcroft (V.).

C. auripennis Say. Gallinas Canon (S.), Water Canon (S.), Sacramento Mts. (K.).

C. inornata Rog. San Ignacio (C.).

Plagiodera oviformis Lec. San Ildefonso (Wheeler Surv.).

P. viridis Melsh. Gallinas Canon (S.), Water Canon (S.), Beulah (C.), Eagle Creek (T.).

P. sp., seems intermediate between *armoraciæ* and *viridis*. Las Vegas (C.).

Gastroides cyanea Melsh. Mesilla Valley, a variety (C.).

Lina arizonæ Cr. Rio Ruidoso (T.), Walnut Creek (S.). In Arizona at Tucson (H. and S.).

L. scripta Fabr. Las Vegas (C.), Santa Fé (Fenyes), Thornton (Fenyes).

Phyllechthrus subsulcatus Horn. Mesilla Park, on *Pectis papposa* (C.).

Trirhabda canadensis Kirby. Gallinas Canon (S.).

T. nigrohumeralis Schaf. Las Vegas Hot Springs (B. and S.).

T. nitidicollis Lec. Glorieta (C.), Santa Fé (Fenyes).

T. convergens Lec. Beulah (C.), Gallinas Canon (S.), between Santa Fé and Ft. Wingate (Wheeler Survey).

T. attenuata Say. Beulah (Skinner).

T. luteocincta Lec. Wootens (K.), Rio Ruidoso (T.). The identity of the last is not certain.

T. flavolimbata Mann. Rio Ruidoso (T.), Beulah (C.), near Wootens (K.).

T. n. sp.? Alamogordo (V.).

Galerucella americana Fabr. Gallinas Canon (S.), Santa Rosa (K.).

G. notulata Fabr. Albuquerque (C.), Mesilla Park (C.), Cloudcroft (K.), Thornton (Fenyes).

G. notata Fabr. Belen, on *Helianthus* (T.).

G. tuberculata Say. Gallinas Canon (S.).

G. decora Say. Pecos (C.), Beulah (V.), "New Mexico" (Fenyes), San Ignacio (C.).

G. decora v. *salicis* Randall. Trout Spring, Gallinas Canon on *Salix* (C.).

Monoxia puncticollis Say. Albuquerque (W.), near Tularosa (C.), Roswell (C.), Santa Rosa (K.).

M. consputa Lec. Albuquerque (W.), Mesilla Valley (T., C.), Rio Ruidoso, identity not certain (T.), Gallinas Canon (S.), Santa Fé Canon (S.). This includes the insect recorded as *guttulata* Lec.

M. debilis Lec. Near Abiquiu (Wheeler Survey), Mesilla Valley (C.). Highrolls (V.).

M. sordida Lec. Mesilla Valley (C.), Wootens (K.). In Arizona at Tucson (H. and S.).

M. sp. "In heads of young balsam pine," Cloudcroft (K.).

Diabrotica tricincta Say. Albuquerque (W.), Socorro (S.), Mesilla Valley (C.), Santa Rosa (K.), Roswell (C.), top of Las Vegas Range (C.), Rio Ruidoso (T.). This species has a vertical range of 7200 ft. in New Mexico.

D. duodecimpunctata Oliv. Albuquerque (W.), Socorro (S.), Pecos (C.), Mesilla (C.), Las Cruces (C.), Santa Fé (Boyle), Embudo (C.), Florida (C.).

D. duodecimpunctata v. *tenellus* Lec. Mesilla Valley (T.), Alamogordo (K.), Deming (Schwarz).

D. longicornis Say. Albuquerque (W.), Socorro (S.), Roswell (C).

D. virgifera Lec. Fort Wallace (cf. Horn), Santa Fé (Fenyes).

D. filicornis Horn. "New Mexico."

D. atripennis Say. Gallinas Canon (S.).

D. atripennis v. *fossata* Lec. "New Mexico."

D. lemniscata Lec. Socorro (S.), Sacramento Mts., 7000 ft. (K.), Fort Union (cf. Horn), near Raton Mts. (cf. Horn).

D. blandula Lec. Near Smoky Hill River (cf. Horn).

D. nitida Linell. "New Mexico" (cf. Townsend).

D. vincta Lec. Pecos (C.).

D. vittata Fabr. Eddy (T.), Whitewater (C.), Mesilla Valley, var. *incerta* Ckll. (C.).

Scelolyperus longulus Lec. Gallinas Canon (S.), between Santa Fé and Fort Wingate (Wheeler Surv.).

Luperodes varicornis Lec. Walnut Creek (S.).

L. lecontei Cr. Gallinas Canon (S.), Pecos (C.), Highrolls (V.), Cloudcroft (V.). Originally described from Santa Fé (Kern and Fendler) as *L. rufipes* Lec.

L. morrisoni Jacoby. Beulah (C.), top of Las Vegas Range, 11,000 ft. (C.).

L. semiflavus n. sp. Dripping Spring, Organ Mts. (C.).

Galeruca externa Say. Gallinas Canon (S.), top of Las Vegas Range, 11,000 ft. (C.), Las Vegas (C.), Eagle Creek (T.), Truchas Peaks (W. P. Cockerell), Cloudcroft (K.).

Blepharida rhois Forst. Organ, on *Rhus* (C.), Alamogordo (V.).

Œdionychis vians Illig. var. ? Santa Rosa (K.).

Œ. lugens Lec. Las Vegas (C.), Santa Fé (Fendler), Sacramento Mts. (K.), Beulah, identity doubtful (Skinner). Santa Fé is the type locality.

Œ. texana Cr. Gallinas Canon (S.).

Œ. flavida Horn. Alamogordo (V.).

Disonycha quinquevittata Say. Colora'o (C.), Albuquerque (W.), Embudo (C.), Mesilla Park (C.), Las Vegas (C.), Santa Fé (Fenyes), San Ildefonso (Wheeler Surv.).

D. crenicollis Say. Mesilla Valley (C.), San Marcial (C.).

D. caroliniana Fabr. Socorro (S.), Santa Fé (Fenyes).

D. arizonæ Casey. Santa Fé, identity doubtful (Fenyes).

D. glabrata Fabr. Mesilla Valley, on *Isocoma* (C.).

D. tenuicornis Horn. Alamogordo (V.).

D. triangularis Say. Gallinas Canon (S.), Las Vegas (C.), Cloudcroft (K.), Beulah (Skinner).

D. xanthomelæna Dalm. Gallinas Canon (S.).

D. politula Horn. Deming (Schwarz), Mesilla (C.), Las Vegas (C.), Mescalero (C.), Sacramento Mts. (K.), Las Cruces, on *Solidago canadensis* (T.).

D. mellicollis v. *semicarbonata* Lec. Cloudcroft (V., K.), Las Vegas (C.), Santa Fé (Fendler). The last is the type locality.

Haltica bimarginata Say. Albuquerque (W.), Santa Fé Canon (S.), San Ildefonso (Wheeler Surv.). Described from Sta. Fé (Fendler), as *H. ambiens* Lec.

H. vicaria Horn. Cloudcroft (K.).

H. carinata Germ. Gallinas Canon (S.), San Ildefonso (Wheeler Survey), Santa Fé (Fenyes), Wootens (K.), Alamogordo (V.), Coolidge, v. *torquata* Lec. (W.). The *torquata* form was described from Santa Fé (Fendler and Kern).

H. obliterata Lec. Rio Ruidoso (T.), Mesilla (C.), Albuquerque (W.), Organ (C.), Soledad Canon, Organ Mts., on *Fallugia* (C.), Grant Co. (Howard), Thornton (Fenyes), Alamogordo (V.). The type was from near Santa Fé (Feldler).

H. tincta Lec. Beulah, identity not certain (C.).

H. punctipennis Lec. Gallinas Canon (S.), Beulah (Skinner), Thornton (Fenyes), Santa Fé (R. C. Kern, *fide* LeConte, 1859).

H. foliacea Lec. Deming (C.), Mesilla Valley (C.), Embudo (C.), Cloudcroft (K.), top of Las Vegas Range, 11,000 ft. (C.), Albuquerque (W.), Roswell (Johnson), Pecos, both blue and green forms (C.).

H. n. sp. ? Cloudcroft (V.).

Crepidodera helxines L. Chicorico Canon, near Raton (C.), Sacramento Mts. (K.), Pecos (C.).

Epitrix cucumeris Harris. Gallinas Canon (S.), Cloudcroft (C.), Wooteus. feeding on corn, beans and potatoes (K.).

E. parvula Fabr. Mesilla, on *Solanum* (C.), Albuquerque (W.), Las Truchas (Clara Gerhardt), Highrolls (V.).

Mantura floridana Cr. Las Vegas (C.).

Chætocnema protensa Lec. Beulah (Skinner).

C. denticulata Ill. Santa Fé Canon (S.).

C. subviridis Lec. East of Santa Fé (C.), Gallinas Canon (S.), Albuquerque (W.), Lone Mtn., near Silver City (C.), Santa Rosa (K.).

C. opulenta Horn. "New Mexico" (cf. Horn).

C. crenulata Cr. Gallinas Canon (S.).

C. costata n. sp. Cloudcroft (V.).

C. decipiens Lec. Wootens (K.).

Systena tæniata Say. Santa Fe (C.), Hatch (C.), Mesilla Park (C.), Thornton (Fenyes), Highrolls (V.), Rio Ruidoso, 6600 ft. on *Rhus*, var. *bitæniata* Lec. (Wooton). The form *bitæniata* was described from Santa Fé (Fendler).

S. tæniata v. *mitis* Lec. Mesilla Valley (C.), Colonia'o (C.), Middle Sonoran Zone.

S. tæniata v. *blanda* Melsh. Santa Fé (C.), Gallinas Canon (S.), Transition Zone.

S. marginalis Ill. Gallinas Canon (S.).

Glyptina cyanipennis Cr. Cloudcroft (V.).

G. nivalis Horn. Near Las Vegas, 7000 ft. (cf. Horn).

G. brunnea Horn. Santa Fè (C.), Beulah (C.).

G. spuria Lec. Gallinas Canon (S.), Santa Fé (C.), Pecos (C.).

G. cerina Lec. Highrolls (V.), Alamogordo (V.), Cloudcroft (V.). In Arizona at Tucson (H. and S.).

G. atriventris Horn. Mesilla Valley (C.), "New Mexico" (cf. Horn).

Phyllotreta albionica Lec. Gallinas Canon (S.), Cloudcroft (K.), Highrolls (V.).

P. pusilla Horn. Beulah (C.), Mesilla Valley (C), Santa Fé (C.), Las Vegas (C.), Gallup (W.), Coolidge (W.), Pecos (C.), Highrolls (V.), Alamogordo (V.), Cloudcroft (V.). This has a remarkable vertical range; it occurs in Arizona at Tucson (H. and S.).

P. æneicollis Cr. Cloudcroft (V.), "New Mexico" (Snow).

P. lewisii Cr. Coolidge (W.).

P. picta Say. Las Vegas Hot Springs (B. and S.).

Longitarsus repandus Lec. Las Vegas Hot Springs (B. and S.).

L. occidentalis Horn. Roswell (C.), La Luz (K.).

L. bicolor Horn. "New Mexico" (cf. Horn), Sacramento Mts. (K.), Highrolls (V.).

L. alternatus Ziegl. Pecos, identity donbtful (Grabbam).

L. sp. near melanurus. Las Vegas Hot Springs (B. and S.).

L. rufescens Horn. Mesilla Valley (C.).

L nitidellus Ckll. "New Mexico" (cf. Horn), Cloudcroft (V.), Beulah (C.).

Dibolia borealis Chevr. Harvey's Ranch, Las Vegas Range (Miss Ruth Raynolds), Beulah (C.).

Psylliodes punctulata Melsh. Beulah (Skinner).

P. convexior Lec. Cloudcroft (K.), Alamogordo (V.).

Microrhopala vittata Fabr. Rio Rioduso (T.), Tsuque (F.).

M. rubrolineata Mann. Alamogordo (V.). In Ariz. at Tucson (H. and S.).

M. rubrolineata v. *vulnerata* Horn. Walnut Creek (S.).

Odontota collaris Say. Walnut Creek (S.), Pecos (C.).

O. omogera Cr. Walnut Creek (S.).

O. nervosa Panz. Gallinas Canon (S.).

Charistena perspicua Horn. "New Mexico."

C. bicolor J. B. Smith. "New Mexico."

Octotoma marginicollis Horn. Walnut Creek (S.).

Cassida nigripes Oliv. Gallinas Canon (S.), Las Vegas, on *Convolvulus incanus* (C.).

C. nigripes v. *ellipsis* Lec. Las Vegas (C.).

C. pallidula Boh. Albuquerque (W.), Mesilla Valley (C.), Las Vegas (C.), Highrolls (V.).

Coptocycla aurichalcea Fabr. Gallina Canon (S.), Rio Ruidoso (T.), Las Vegas (C.).

C clavata Fabr. Mesilla (C.).

Chelymorpha argus Licht. Mesilla, on *Solanum* (C.).

C. phytophagica Cr. Mesilla Valley (T.), Las Cruces (C.).

BRUCHIDÆ.

Bruchus discolor Horn. Mesilla Valley (C.), near Roswell, bred from pods of *Cassia roemeriana* (C.), Alamogordo (V.), Cloudcroft (V.).

B. pruininus Horn Mesilla Valley (C.), Alamogordo (V.), Highrolls (V.). In Arizona at Tucson (H. and S.).

B. desertorum Lec. Mesilla Valley (C.).

B. aureolus Horn. Gallinas Canon (S.), Pecos (C.).

B. pauperculus Lec. Mesilla Valley (T.), Pecos (C.).

B. prosopis Lec. Socorro (S.), Deming (C.), Mesilla Park (C.), Alamogordo (V.). In Arizona at Tucson (H. and S.).

B. uniformis Lec. Mesilla Valley (C.).

B. bisignatus Horn. Albuquerque (W.).

B. alboscutellatus Horn. Mesilla Valley (cf. Ashmead).

B. fraterculus Horn. Santa Fé (C.), San Ildefonso (Wheeler Surv.), Highrolls (V.), Alamogordo (V.), Santa Rosa (K.).

B. amicus Horn. Mesilla Valley (cf. Ashmead), Gallup (W.), La Cueva, Organ Mts. (T.), Alamogordo (V.), Santa Fé (Fenyes). In Arizona at Tucson (H. and S.).

B. exiguus Horn. Albuquerque (W.).

B. seminulum Horn. Albuquerque (W.), Las Vegas (C.).

B. n. sp. Cloudcroft (V.).

B. n. sp. Albuquerque (W.).

B. n. sp. Las Vegas Hot Springs (B. and S.).

B. n. sp. Las Vegas Hot Springs (B. and S.).

TENEBRIONIDÆ.

Edrotes rotundus Say. Albuquerque (W.), Santa Fé (C.).

Triorhophus lævis Lec. Mesilla Valley (C.). Possibly an incorrect identification; the species may be *nodiceps*. Schwarz reports *T. lævis* from Tucson, Ariz. (H. and S.).

Trimytis pruinosa Lec. Taos (Wheeler Survey), Thornton (Fenyes).

Eurymetopon rufipes Esch. Mesilla Valley (C.). In Arizona at Tucson (H. and S.).

E. marginatum Casey. Albuquerque (W.), Mesilla Valley (C.).

E. serratum Lec. Albuquerque (W.).

E. crassulum Casey. Mesilla Valley (C.).

E. congener Casey. Albuquerque (C.).

E. sp. Mesilla Park (C.).

E. longipennis Casey. "New Mexico."

Emmenastus texanus Lec. Mesilla Valley (C.).

E. longulus Lec. Mesilla Valley (C.). Very probably incorrectly identified.

E. convexus Lec. Organ (C.), Alamo Canon (V.).

E. fallax Casey. San Geronimo (W. P. Cockerell and Mary Cooper), Cloudcroft, a variety (K.).

E. coarcticollis Casey. "New Mexico."

Epitragus acutus Lec. Albuquerque (W.).

E. canaliculatus Say. Santa Fé (C.), Mesilla Valley (C.), Gallinas Canon (S.), Albuquerque (W.), Santa Fé Canon (S.), Vega S. José (T.). Pecos (C.), Embudo (C.), Organ Mts. (C.).

E. plumbeus Lec. Coolidge (W.).

Zopherus concolor Lec. Santa Fé (C.), Pecos (C.). Abiquiu (W.). Sacramento Mts. (K.), Cloudcroft, identity not certain (C.), Cloudcroft (V.), Highrolls (V.).

Z. granicollis Horn. Albuquerque (W.), Coolidge (W.).

Arræoschizus costipennis Lec. Mesilla Valley (C.), Deming (C.), Fort Cummings (cf. Horn).

A. regularis Horn. Deming (C.).

A. decipiens Horn. Deming (C.).

A. possibly fimbriatus Casey. Santa Rosa (K.).

Cryptoglossa lævis Lec. Mesilla Valley (C.), Grant Co. (Howard).

Microschatia morata Horn. Grant Co. (Gissler). Also collected by Howard.

Ologlyptus anastomosis Say. "New Mexico" (Wickham). LeConte, 1859, says "Kansas and New Mexico, near the Rocky Mountains."

Astrotus regularis Horn. Water Canon (S.).

Asida opaca Say. Cloudcroft (K.), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Santa Fé (C.), Beulah (Skinner), Santa Fé Canon (S.), Raton (C.), Organ Mts. (T.). LeConte remarks that specimens from New Mexico are smaller, and have the elytra much more uneven than those found near the Platte River.

A. mancipata Horn. Grant Co. (Gissler).

A. polita Say. Gallinas Canon (S.), Water Canon (S.), Santa Fé (Fenyes).

A. quadricollis Horn. Ft. Bayard (Gissler).

A. sordida Lec. Gallinas Canon (S.), Water Canon (S.), Grant Co. (Howard), Albuquerque (C.).

A. costipennis Lec. "New Mexico" (cf. Ulke).

A. morbillosa Lec. Water Canon (S.), Deming (Schwarz).

A. confluens Lec. Canon de Chelle (Wheeler Surv.).

A. convexa Lec. Albuquerque (W.), Water Canon (S.), Santa Fé (Fenyes). Thornton (Fenyes).

A. obovata Lec. Grant Co. (Howard), Vega S. José (T.).

A. convexicollis Lec. "New Mexico" (cf. Ulke), Magdalena Mts. (S.).

A marginata Lec. Water Canon (S.), Mesilla Valley (C.), Alamogordo (V.).

A. marginata v. *rimata* Lec. Water Canon (S.).

A. elata Lec. Water Canon (S.), Parker's Well, Organ Mts. (C.), Glorieta (C.), between Abiquiu and Jemez (Wheeler Surv.), Canon de Chelle (Wheeler Surv.), Santa Fé (Fenyes).

A. macra Horn. "New Mexico" (S.).

Eusattus reticulatus Say. Pescao (Wheeler Surv.), between Santa Fé and Ft. Wingate (Wheeler Surv), Raton (C.), Water Canon (S.), Albuquerque (W.), Coolidge (W.), Mesilla Valley (C.), Grant Co. (Howard). Santa Fé (cf. LeConte), San Augustine (C.), Deming (W.).

E. convexus Lec. (*difficilis*, auctt.). Coolidge (W.), Las Vegas (C.), Albuquerque (C.), Mesilla Valley (C.), Engle (Nora Newberry), Highrolls (V.).

E. muricatus Lec. "New Mexico" (cf. Ulke).

*Eleodes obscura Say. Pecos (C.), Ancho (K.), Gallinas Canon (S.), Water Canon (S.), Las Vegas (W. P. C.), Glorieta (C.), Santa Fé (cf. Blaisdell).

E. obscura v. *dispersa* Lec. Gallinas Canon (S.), Water Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Watrous (C.), Pescao (Wheeler Survey), Ft. Wingate (Wheeler Survey), between Santa Fé and Fort Wingate (Wheeler Survey), Taos (Wheeler Survey).

* Dr. Blaisdell has kindly sent all New Mexican references contained in his coming monograph of the Blaptini, thus adding much to the value of the list.

E. obscura v. *sulcipennis* Mann. "New Mexico" (cf. Ulke), Fort Wingate (Wheeler Survey), as *arata* Lec.

E. acuta Say. Las Vegas (C.).

E. suturalis Say. Albuquerque (W), Water Canon (S.), Las Vegas (Gilbert Rosenwald).

E. suturalis v. *texana* Lec. Gallinas Canon (S), Albuquerque (cf. Blaisdell).

E. pedinoides v. *neomexicana* Blaisd. Rio Ruidoso (T.), Sacramento Mts. (K.).

E. tricostata Say. Albuquerque (W.), Gallinas Canon (S.), Santa Fé (C.), Coolidge (W.), Gallup (W.), Rio Ruidoso (T.), Las Vegas (C.), Beulah (Skinner), Pecos (C.), Pescao (Wheeler Surv.), between Santa Fé and Ft. Wingate (Wheeler Surv.), Abiquiu (Wheeler Surv.).

E. carbonaria Say. Water Canon (S.), Cloudcroft (V.), Highrolls (V.), Deming (cf. Blaisd.), Mt. Park (K.).

E. debilis Lec. Water Canon (S.), Santa Fé (Riley).

E. ampla Blaisd. Santa Fé Canon (cf. Blaisd.).

E. obsoleta Say. Pecos (C.), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Santa Fé (C.), Lone Mtn. (C.), Glorieta (C.), between Santa Fé and Ft. Wingate (Wheeler Surv.), Coolidge (W.), Gallup (W.), Las Vegas (C.), Deming (Schwarz).

E. obsoleta var. *porcata* Csy. Pecos (cf. Blaisd.).

E. knausii Blaisd. Cloudcroft (K.). Also taken by Viereck.

E. quadricollis Esch. Santa Fé Canon (S.), between Santa Fé and Ft. Wingate (Wheeler Surv.). [Probably an erroneous determination.]

E. humeralis Lec. Beulah (Skinner).

E. extricata Say. Beulah (Skinner), Albuquerque (W.), Gallinas Canon (S.), Water Canon (S.), Santa Fé (C.), Cloudcroft (C.), between Santa Fé and Fort Wingate (Wheeler Survey), Santa Fé Canon (S.), Coolidge (W.), Las Vegas (C.), Deming (Schwarz), Gallup (Helen Blake), White Mts., 11,092 ft., a variety (T.).

E. extricata v. *cognata* Hald. Sacramento Mts. (K.).

E. longicollis Lec. Albuquerque (W.), Water Canon (S.), Coolidge (W.), Gallup (W., and Helen Blake), Mesilla Valley (C.), Santa Fé (Fenyes), Luna (cf. Blaisd.).

E. ventricosa Lec. Water Canon (S.).

E. gracilis Lec. Water Canon (S.).

E. wickhami Horn. Las Cruces (cf. Blaisd.).

E. nigrina Lec. Santa Fé Canon (S.), Santa Fé (C.), Coolidge (W.), Taos (Wheeler Survey), Wootens (K.), Cloudcroft, a large robust race (K.), Highrolls (V.).

E. hispilabris Say. Albuquerque (W.), Coolidge (W.), Mesilla Valley (T.), Las Vegas (G. Rosenwald).

E. sponsa Lec. Santa Fé (C.), Coolidge (W.), Taos (Wheeler Survey), Pecos (M. Grabham), Glorieta (C.), Highrolls (V.), Aztec (Baker).

E. caudifera Lec. Water Canon (S.), Coolidge (W.), Pescao (Wheeler Survey), between Santa Fé and Ft. Wingate (Wheeler Survey), Thornton (Fenyes), Aztec (Baker), Luna (cf. Blaisd.).

E. pilosa Horn. Coolidge (W.), "N. Mex." (Nat. Mus. coll.).

E. lecontei Horn. Sacramento Mts. (K.), Beulah (Skinner), Pecos (C.), Cloudcroft (V.).

E. lecontei v. *snowii* Blaisd. Cloudcroft (K.). [This and the preceding are presumably one thing.]

E. consobrina Lec. Sta. Fé Canon (S.). [Probably a wrong determination.]

E. planipennis Lec. Water Canon (S.), Santa Fé Canon (S.), Santa Fé (C.), Rio de las Casas (Sturgis), Coolidge (W.), Las Vegas (G. Rosenwald and Martin D. Cockerell).

E. opaca Say. Coolidge (W.).

E. fusiformis Lec. Albuquerque (W.), Coolidge (W.).

E. goryi Sol. (*fusiformis* Lec.) "New Mex." (Horn).

E. dissimilis Blaisd. Highrolls (V.).

Embaphion contusum Lec. Coolidge (W.), Mesilla Valley (T.), Santa Fé (cf. LeConte), Gallup (Helen Blake), Fort Wingate (Wheeler Survey), Pescao (Wheeler Survey), between Santa Fe and Ft. Wingate (Wheeler Survey), Deming (Schwarz), Las Vegas (cf. Blaisdell).

E. glabrum Blaisd. Coolidge (W.).

E. elongatum Horn. Coolidge (W.). Perhaps not different from preceding.

E. planum Horn. San Juan River (Wheeler Surv.).

E. contractum Blaisdell. Under pine bark and chips, seven specimens, Cloudcroft (K.).

[*E. muricatum* Say occurs in both Colorado and Texas and will no doubt be found in New Mexico.]

Nyctobates pennsylvanica DeG. San Ildefonso (Wheeler Survey).

Iphthimus serratus Mann. Gallinas Canon (S.), Santa Fè Canon (S.), Sacramento Mts. (K.), Ponil Canon (Miss Grace Eaton).

I. serratus v. *sublævis* Bland. Taos (Wheeler Surv.).

I. zopheroides Horn. "New Mexico" (Fuller).

Cœlocnemis punctata Lec. Albuquerque (W.), Coolidge, a variety (W.), Gallup (Helen Blake).

Tenebrio obscurus Fabr. Albuquerque (W.), Mesilla Valley (C.), Santa Fé (C.), Las Vegas (G. Rosenwald), Beulah (C.), Tsuque (Fenyes).

T. molitor L. Albuquerque (C.), Alamogordo (K.).

Bius estriatus Lec. Walnut Creek (S.), Cloudcroft (V.).

Eupsophus castaneus Horn. Mesilla Valley (C.).

Mecysmus angustus Lec. Deming (Schwarz).

M. parvulus Casey. Coolidge (W.), Mesilla Valley (C.).

Blapstinus fuscus Casey. San Marcial (C.).

B. fortis Lec. Mesilla Valley (C.).

B. dilatatus Lec. Mesilla Valley (C.).

B. pratensis Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Santa Fé (C.), San Ildefonso (Wheeler Survey).

B substriatus Champion. San Geronimo, identity not certain (W. P. Cockerell and M. Cooper).

B. pulverulentus Mann. Deming (Schwarz). [The identity is very questionable.—H. C. F.]

B. lecontei Muls. Mesilla Valley (C.), Coolidge (W.). According to Casey this is the same as *pubescens* Lec.

B. sp. Beulah (C.).

B. sp. Near Las Vegas (C.).

B. sp. Sacramento Mts. (K.).

Conibius uniformis Casey. Santa Rosa (K.). Identity not certain.

Ulus sp. The New Mexico species has not been determined, but it is probably *fimbriatus* Csy., described from El Paso, Texas.

Cnemeplatia sericea Horn. Albuquerque (W.).

Tribolium madens Charp. Cloudcroft (K.).

T. confusum Duval. Mesilla Valley (C.).

Aphanotus parallelus Casey. La Trementina (Alice Blake).

Cynæus angustus Lec. Albuquerque (W.), Mesilla Valley (C.).

Paratenetus crinitus Fall. Trout Spring (C.).

Platydema oregonense Lec. Gallinas Canon (S.), Santa Fé (Fenyes), Cloudcroft (K.), Mt. Park (K.).

Hypophlœus parallelus Melsh. Sacramento Mts. (K.), Cloudcroft (K.).

Helops arizonensis Horn. Walnut Creek (S.), Deming (Schwarz).

H. attenuatus Lec. Coolidge (W.).

CISTELIDÆ.

Hymenorus obscurus Say. Gallinas Canon (S.), Santa Fé Canon (S.). Doubtless a wrong identification.

H. apacheanus Casey. Santa Fé (C.). The same species was determined by Linell as *occidentalis*.

H. confertus Lec. Mesilla (C.).

H. indutus Casey. Albuquerque (W.).

H. punctatissimus Lec. Mesilla Valley (C.), Rincon, on Mesquite (C.), La Trementina, identity not certain (Alice Blake), Thornton, identity not certain (Fenyes).

H. sp. La Trementina (Alice Blake).

H. sp. Deming (W.).

H. sp. Alamogordo (K.).

H. appar. n. sp. Pecos Canon (C.).

Cistela pinguis Lec. Gallinas Canon (S.), Santa Fé (Fendler). The latter is the type locality.

C. sericea Say. "New Mexico."

Telesicles cordatus Champion. Gallup (W.), Deming (Schwarz).

Mycetochares lugubris Lec. Santa Fé Canon (S.).

OTHNIIDÆ.

Othnius umbrosus Lec. Santa Fé Canon (S.).

LAGRIIDÆ.

Statira pluripunctata Horn. San Augustine, E. base of Organ Mts. (C.).

S. opacicollis Horn. San Augustine, in flowers of *Datura meteloides* (C.).

It is doubtful whether the specimens from San Augustine represent more than one species, though they have been identified as above.

S. robusta Schaeffer. "New Mexico" (S.).

MONOMMIDÆ.

Hyporhagus opuntiæ Horn. Alamogordo (V.). In Arizona at Tucson (H. and S.).

MELANDRYIDÆ.

Tetratoma concolor Lec. Gallinas Canon (S.).

Penthe pimelia Fabr. San Ildefonso (Wheeler Survey).

Zilora hispida Lec. Santa Fé Canon (S.).

Carebara longula Lec. Gallinas Canon (S.), Sacramento Mts., identity not certain (K.).

C. brevicollis n. sp. Cloudcroft (K.).

Serropalpus barbatus Schall. Santa Fé Canon (S.).

Eustrophus indistinctus Lec. Walnut Creek (S.).

E. bicolor Say. Mesilla, in a fungus (C.).

E. arizonensis Horn. "New Mexico," Highrolls (V.), Las Vegas Hot Springs (B. and S.), Cloudcroft (K.). Knaus found it under pine bark.

Hallomenus scapularis Melsh. Highrolls (V.), Cloudcroft (K.). Knaus found it under bark.

H. punctulatus Lec. Santa Fé Canon (S.).

Canifa sp. Alamogordo (V.).

Lacconotus pinicolus Horn. Beulah (C.), Cloudcroft (V.).

Mycterus concolor Lec. Coolidge (W.), Pecos (C.), Wootens (K.), Alamogordo (V.), Highrolls (V.).

M. quadricollis Horn. Mesilla Valley (C.).

PYTHIDÆ.

Lecontia discicollis Lec. Gallinas Canon (S.), under pine bark, Cloudcroft (K.).

Salpingus virescens Lec. Gallinas Canon (S.), Beulah (C.), Wootens (K.).

S. tibialis Lec. Sacramento Mts. (K.).

ŒDEMERIDÆ.

Calopus angustus Lec. "New Mexico."

Copidita obscura Lec. Gallinas Canon (S.), Santa Fé (C.), Beulah (Skinner, C.), Las Vegas (C.), Pecos (C.).

Asclera puncticollis Say. Beulah (Skinner).

A obscura Lec. "New Mexico."

A. sp. near excavata. Pecos, at flowers of *Fallugia* (C.), Cloudcroft (V.).

A Pecos specimen is intermediate between *excavata* and *ruficollis*, and probably represents a distinct species.

Oxacis pallida Lec. "New Mexico" (cf. Ulke), Colora'o (C.). Alamogordo (K.).

O. bicolor Lec. Albuquerque (W.), Mesilla Valley, a variety (C.), Coolidge (W.), Santa Fé (C.), Silver City (C.), Thornton (Fenyes), Las Vegas Hot Springs (B. and S.).

O. sororia Horn. Mesilla Park (C.).

MORDELLIDÆ.

Diclidia lætula Lec. "New Mexico" (cf. Townsend), Pecos Canon, 3 miles above Pecos (C.).

Pentaria trifasciata Melsh. Santa Fé (C.), Mesilla Valley, a variety (C.).

P. nubila Lec. Alamogordo (V.). In Arizona at Tucson (H. and S.).

P. fuscula Lec. Gallup (W.), Pecos, on flowers of *Clematis ligusticifolia* (C.), Glorieta (C.), Cloudcroft (K.), Santa Fé (Fenyes), Alamogordo (V.), Highrolls (V.).

P. pusio Lec. Alamogordo (V.), Albuquerque (W.), Gallinas Canon (S.), Mesilla Valley (C.).

Anaspis nigra Hald. Santa Fé Canon (S.).

A. atra Lec. Gallinas Canon (S.), Santa Fé (C.), Rio Ruidoso (T.), Beulah (C.), Sacramento Mts. (K.).

A. rufa Say. Gallinas Canon (S.), Sacramento Mts. (K.).

A. sp. Beulah (C.).

A. collaris Lec. Santa Fé (Fenyes).

Mordella quadripunctata Say. Pecos, on *Apocynum* (C.).

M. scutellaris Fabr. Gallinas Canon (S.), Sacramento Mts. (K.), Beulah (C.), Pecos (C.), Beatty's Cabin (W. P. C.), Santa Fé (Fenyes), Cloudcroft (V.).

M. marginata Melsh. Rio Ruidoso (T.).

M. insulata Lec. Gallinas Canon (S.).

M. fuscocinerea n. sp. Alamogordo (V.).

M. perlineata n. sp. Alamogordo (V.), Cloudcroft (V.).

Mordellistena festiva n. sp. Las Vegas Hot Springs (B. and S.).

M. adspersa Melsh. Mesilla Valley (C.).

M. pallens n. sp. Mesilla Valley (C.), Deming (Schwarz).

M. inornata J. B. Smith. Wootens (K.).

M. impatiens Lec. Mesilla Valley (C.). Identity somewhat doubtful.

M. nigricans Melsh. Cloudcroft (K.).

M. nubila Lec. var. Mesilla Park (C.).

M. pustulata Melsh. Mesilla Valley (C.).

M. morula Lec. Pecos (C.), Beulah, identity not certain (Skinner, C.). The same insect as that from Beulah, also at Viveash Ranch (C.), and Rio Ruidoso (T.).

M. suspecta n. sp. Pecos (C.).

M. sericans n. sp. Albuquerque (W.), Santa Fé (C.), Gallup (W.), Cloudcroft (K.), Wootens (K.), Elba (Fall). This species has long been called *unicolor* Lec., but that determination is surely incorrect.

M. divisa Lec. Pecos (C.).

M. angusta Lec. Santa Fé Canon (S.).

M. æmula Lec. Santa Fé (Fenyes), Albuquerque (W.).

ANTHICIDÆ.

Stereopalpus mellyi Laf. Pecos, identity not certain (C.).

Corphyra lewisii Horn. Pecos (C.), Cloudcroft (V).

C. lewisii v. *variabilis* Horn. "New Mexico."

C. collaris Say. Sacramento Mts. (K.).

Xylophilus piceus Lec. Gallinas Canon (S.). Identity doubtful.

X. impressus Lec. var. Deming (H. and S.).

Notoxus nuperus Horn. "New Mexico" (cf. Horn), Deming (Schwarz), Albuquerque (W.).

N. talpa Laf. (*subtilis* Lec.). "New Mexico" (cf. Ulke).

N. bifasciatus Lec. Albuquerque (W.), Walnut Creek (S.).

N. apicalis Lec. Roswell, identity not certain (C.), the same also from Albuquerque (W.).

N. calcaratus Horn. Mesilla Valley (C.), Fresnal Creek (K.), Santa Fé (Fenyes), Alamogordo (V.), Albuquerque (W.).

N. monodon Fabr. Mesilla Valley (C.), Deming (Schwarz). In Arizona at Tucson (H. and S.).

N. serratus Lec. Albuquerque (W.), Gallup (W.), Mesilla Valley (C.), Florida (C.).

N caudatus Fall. Santa Fé (Fenyes).

N. montanus Casey. Wootens (K.), Pecos (C.), Tsuque (Fenyes). There is scarcely a doubt that this and *bifasciatus* above are the same thing; whether there is really more than one species is a question.

Formicilla evanescens Casey. Mesilla Valley, a variety (C.).

Anthicus (Baulius) tenuis Lec. Albuquerque (W.), Coolidge (W.). In Arizona at Tucson (H. and S.).

A. (Malporus) formicarius Laf. Deming (Schwarz).

A. (Lappus) obscurus Lec. Gallup (W.). This was very likely *subtilis*.

A. (Lappus) cursor Casey. Fresnal Creek (K.), Alamogordo (V.).

A. (Lappus) lividus Casey. Fresnal Canon (K.).

A. (Lappus) sturmii Laf. "New Mexico" (cf. Townsend).

A. (L.) sturmii v. *elegans* Laf. Mesilla Valley (C.).

A. (Lappus) nitidulus Lec. Mesilla Valley (C.).

A. (Lappus) subtilis Casey. Gallup (W.).

A. (Thicanus) rejectus Lec. Albuquerque (W.). This was probably *mimus*.

A. (Thicanus) mimus Casey. Coolidge (W.).

A. (Vacusus) lætus Laf. Mesilla Park (C.).

A. (Vacusus) confinis Lec. Mesilla Valley (C.), Deming (Schwarz), Roswell (C.).

A. (Hemantus) floralis L. Albuquerque (W.), Mesilla Valley (C.), Santa Fé Canon (S.), Roswell (C.).

A. (Hemantus) rixator Casey. Albuquerque (cf. Casey).

A. ephippium Laf. Albuquerque (W.), Mesilla Valley (C.).

A. biguttulus Lec. Albuquerque (W.), Coolidge (W.), Mesilla Valley (C.).

A. cervinus Laf. Mesilla Park (C.), Roswell (C.), Wootens (K.).

A. parallelus Casey. Coolidge (W.).

A. junctus Casey. Las Vegas (C.), Pecos (C.).

A. nanus Lec. Albuquerque (W.). In Arizona at Tucson (H. and S.).

A. innocens Casey. Roswell, identity not certain (C.).

A. bellulus Lec. Wiegand Ranch, near Las Vegas (C.), Las Valles (C.).

A. lutulentus Casey. Near Las Vegas (C.), Elba (Fall).

A. melancholicus Laf. Cooliege (W.).

A. (Sapintus) fulvipes Laf. Coolidge (W.).

A. sp. Wootens (K.).

A. sp. Sacramento Mts. (K.).

MELOIDÆ.

Cysteodemus wislizeni Lec. Mesilla Valley, very common (C.), Socorro (S.), Thornton (Fenyes). Discovered by Dr. Wislizenus on his famous journey from Santa Fé to Chihuahua.

Megetra vittata Lec. Socorro (S.), Organ Mts. (C.), Coolidge (W.), Gallup (W.), Canon de Chelle (Wheeler Survey), Santa Fé (Fenyes).

Melœ sublævis Lec. Gallinas Canon (S.), Socorro (S.), Santa Fé (C.), Luna (W.), Las Vegas (C.).

Nomaspis parvula Hald. Las Vegas, on flowers of *Aragallus*, May (C.).

Nemognatha lurida Lec. Albuquerque (W.), Santa Fé Canon (S.), Pecos (C.), Fort Wingate (Wheeler Survey), Las Truchas (Clara Gerhardt).

N. apicalis Lec. "New Mexico" (cf. Ulke), Santa Fé, on *Cleome serrulata* (C.).

N. lutea Lec. Gallinas Canon (S.).

N. bicolor Lec. Gallinas Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Santa Fé Canon (S.), Gallup (W.), Las Vegas, on *Carduus* (C.).

N. piezata Fabr. Pecos (C.), Highrolls (V.).

N. nigripennis Lec. Gallinas Canon (S.), Pescao (Wheeler Survey).

N. cribraria Lec. Gallinas Canon (S.), Santa Fé Canon (S.), Beulah, identity not quite certain (C.).

N. scutellaris Lec. Beulah (Phila. Acad.).

N. immaculata Say. Santa Fé (C.), Santa Fé Canon (S.), Gallinas Canon (S.), Roswell (C.), Sacramento Mts. (K.), Beulah (C.), Pecos (C.).

N. punctipennis Lec. Walnut Creek (S.).

N. sparsa Lec. Socorro (S.), Albuquerque (W.), also collected by E. O. Wooton (No. 37) on his expedition to Sierra Blanca.

N. vittigera Lec. Santa Fé (C.).

N. cribricollis Lec. Gallinas Canon (S.), Socorro (S.).

N. about four new (?) species. Alamogordo (V.).

[An undescribed species of *Nemognatha* was taken at Fort Bliss, Texas (C.); Mr. Schwarz, who determined it, states that it also occurs at San Diego, Texas. It is almost certain that it will be found to enter New Mexico, to the north of Fort Bliss.]

Gnathium francilloni Kirby var. *flavicolle* Lec. Santa Fé (C.), Tsuque (Fenyes).

G. minimum Say. "New Mexico" (fide Wickham).

G. texanum Horn. Mesilla (C.).

G. nititum Horn. Albuquerque (W.), Mesilla Valley (C.), Las Truchas (Clara Gerhardt).

Zonitis atripennis Say. Santa Fé Canon (S.), Santa Fé (C.). Occurs on *Cleome serrulata*.

Z. martini n. sp. Mesilla Park, on *Prosopis glandulosa*, May 14th (Martin D. Cockerell), Engle (Nora Newberry), Alamogordo (V.).

Z. flavida Lec. Santa Fé Canon (S.), Las Vegas (C.), San Ildefonso (Wheeler Survey).

Z. bilineata Say. Gallinas Canon (S.), Tsuque (Fenyes).

Z. rufa Lec. Gallinas Canon (S.), Mt. Park (K.).

Leonidia neomexicana Ckll. Mesilla Valley (C.), Las Vegas (C.).

Macrobasis albida Say. Las Truchas (Clara Gerhardt), Georgetown (cf. Chittenden).

M. longicollis Lec. Albuquerque (W.), Mesilla Valley (C.), Lava.

M. atrivittata Lec. Albuquerque (W.).

M. unicolor Kirby. Gallinas Canon (S.), Beulah (Skinner), Cloudcroft (V.).

M. linearis Lec. Cloudcroft (V.), Alamogordo (V.).

M. ochrea Lec. Walnut Creek (S.).

M. gissleri Horn. Grant Co. (Gissler), region of Organ Mts. (T.).

M. lauta Horn. Alamogordo (K.). In Arizona at Tucson (H. and S.).

M. tenella Lec. Mesilla Park (C.). In Arizona at Tucson (H. and S.).

M. segmentata Say. San Ildefonso (Wheeler Surv.), Roswell (C.).

Tetraonyx femoralis Dugés. Mesilla Valley (C.).

T. fulva Lec. Albuquerque (W.), Mesilla Valley (C.), Luna (W.), Sacramento Mts. (K.), Pecos (C.), Santa Fé (Fenyes), Highrolls (V.).

Pleuropompha costata Lec. Deming (Snow, Schwarz), Roswell (C.), Mesilla Park (C.).

Epicauta ferruginea Say. Gallinas Canon (S.), Socorro (S.), Mesilla Valley (C.).

E. sericans Lec. Gallinas Canon (S.), Mesilla Valley (C.).

E. pruinosa Lec. Between Santa Fé and Ft. Wingate (Wheeler Survey).

E. ruidosana Fall. Rio Ruidoso (T.), nearest to *caviceps*.

E. ingrata Fall. Wootens (K.), Highrolls (V.), Cloudcroft (K.), Pecos (C.), nearest to *pedalis*.

E. pardalis Lec. Gallo Spring (T.).

E. maculata Say. "New Mexico" (Wheeler Survey), Coolidge (W.). The form called *conspersa* Lec. was found between Santa Fé and Ft. Wingate (Wheeler Survey). Highrolls (V.).

E. funebris Horn. Mesilla Valley (T.).

E. corvina Lec. Socorro (S.), La Cueva, Organ Mts. (T.).

E. pennsylvanica DeG. Albuquerque (W.), Raton (C.), San Ignacio (C.), Las Vegas (C.), Roswell, unusually large (C.), above Mescalero (Wooton), San Ildefonso (Wheeler Survey).

E. sp. Roswell (C.).

E. sp. Pecos (C.).

E. sp. Sacramento Mts. (K.).

E. n. sp. Cloudcroft (V.).

Pyrota mylabrina Chevr. Socorro (S.), Albuquerque (W.), Roswell (C.).

P. engelmanni Lec. Roswell (C.).

P. postica Lec. Mesilla Valley (T.).

P. punctata Casey. Deming (Schwarz).

P. akhurstiana Horn. Deming (Schwarz). In Ariz. at Tucson (H. and S.).

P. bilineata Horn. Thornton (Fenyes), Albuquerque (W.). The Mesilla Valley (C.) insect reported as *lineata* Oliv. is doubtless this.

Cantharis mutilata Horn. Socorro (S.), Mesilla (C.).

C. vulnerata Lec. Mesilla Valley (C.).

C. deserticola Horn. Walnut Creek (S.).

C. melæna Lec. Organ (T.).

C. nuttalli Say. Top of Las Vegas Range, 11,000 ft. (C.), Beulah (C.).

C. viridana Lec. Harvey's Ranch, Las Vegas Range (Ruth Raynolds).

C. puberula Lec. Wootens (K.).

C. biguttata Lec. Gallinas Canon (S.), Socorro (S.), Santa Fé (C.), Glorieta (C.), Pecos (C.), Roswell (C.), Mesilla Valley (C.), Las Vegas, on *Verbesina* (C.).

C. gentilis Horn. "New Mexico."

Calospasta viridis Horn. "New Mexico" (S.).

Negalius marmoratus Casey. Mesilla Park, running on the ground in a sandy place (C.).

Eupompha fissiceps Lec. Socorro (S.), Mesilla Valley (T.).

RHIPIPHORIDÆ.

Toposcopus wrightii Lec. Side of canon above Embudo (C.).

Rhipiphorus flavipennis Lec. Rincon, on *Prosopis glandulosa* (C.), Mesilla (C.).

R. pectinatus Fab. Gallinas Canon (S.), Mesilla Valley v. *fasciatus* Mels. (C.).

R. cruentus Germ. Fillmore Canon, Organ Mts. (T.), Glorieta (C.), Alamogordo (V.).

Myodites vierecki n. sp. Alamogordo (V.).

M. scaber Lec. Chaves (T.), Pecos (C.).

M luteipennis Lec. Mesilla Valley (C.).

M. nevadicus Lec. Mesilla Valley (T.), Santa Fé (Fenyes).

RHINOMACERIDÆ.

Rhinomacer comptus Lec. Cloudcroft (K.).

RHYNCHITIDÆ.

Eugnamptus collaris Fab. Sacramento Mts. (K.).

Rhynchites bicolor Fab. Santa Fé (C.), Gallinas Canon (S.), Beulah (C.), Pecos (Grabham), Cloudcroft (V.), Highrolls (V.).

R. æneus Boh. Gallinas Canon (S.), Las Vegas (C.), Beulah (C.), Pecos (C.). Santa Fé (Fenyes).

R. æratus Say Alamogordo (V.).

Deporaus glastinus Lec. Sacramento Mts. (K.), Cloudcroft (V.).

ATTELABIDÆ.

Attelabus bipustulatus Fab. Rio Ruidoso (Townsend, Wooton).

A. genalis Lec. "New Mexico."

A. rhois Boh. Sacramento Mts. (K.), Cloudcroft (V.).

BYRSOPIDÆ.

Thecesternus humeralis Say. Gallinas Canon (S.), Socorro (S.), Albuquerque (W.), Las Vegas (C.), Santa Fe (Fenyes).

OTIORHYNCHIDÆ.

Epicærus imbricatus Say. Coolidge (W.).

Calyptillus cryptops Horn. "New Mexico."

Ophryastes vittatus Say. Socorro (S.), Albuquerque (W.), Mesilla Valley (C.), Coolidge (W.), Gallup (W.), Tierra Amarilla (Wheeler Survey), Santa Fé (Fenyes).

O. tuberosus Lec. Grant Co. (Howard), Santa Fé (Fenyes).

O. latirostris Lec. Albuquerque (W.), Gallup (W.), Tularosa Creek (T.).

O. sulcirostris Say. Las Vegas (C.), Gallup (W.), Alamogordo (V.).

O. symmetricus n. sp. Santa Fé (Fenyes).

Eupagoderes decipiens Lec. Mesilla Valley (T.). In Arizona at Tucson (H. and S.).

E. sordidus Lec. Albuquerque (W.), Coolidge (W.), Santa Fé (C.), Thornton (Fenyes).

E. varius Lec. Alamogordo (V.).

Anametis grisea Horn. Gallinas Canon (S.), Beulah (C.).

A. subfusca n. sp. Cloudcroft and Wootens (K.).

Orimodema protracta Horn. Sacramento Mts. (K.).

Diamimus subsericeus Horn. "New Mexico."

Peritaxia rugicollis Horn. Santa Fé Canon (S.), Sacramento Mts. (K.), Las Vegas (C.), Dripping Spring, Organ Mts. (C.), Pecos (C.).

P. hispida Horn. Santa Fé, on *Argemone* (C.), La Cueva, Organ Mts. (T.), Las Valles (C.), Pecos (C.).

P. sp. Cloudcroft (V.).

Sapotes puncticollis Csy. Deming (W.).

Cimbocera conspersa n. sp. Santa Fé (Fenyes), Tsuque (Fenyes), San Ildefonso.

Otiorhynchus ovatus Lec. Santa Fé, abundant, of course introduced (C.). See Wickham, Societas Entomologica (Zurich), Dec., 1894, p. 131.

Thricolepis inornata Horn. Gallinas Canon (S.), Sacramento Mts., a variety (K.), Beulah (C.), Pecos (C.).

Elissa laticeps Casey. Alamogordo (V.). In Arizona at Tucson (H. and S.).

Tanymecus lacæna Hbst. Walnut Creek (S.).

Pandeletejus hilaris Hbst. Gallinas Canon (S.), Santa Fé Canon (S.).

P. rotundicollis n. sp. Common on scrub oak at Cloudcroft (K.). Also taken by Viereck.

P. cinereus Horn. Mesilla Valley (T.), Alamogordo (V.), La Luz Canon (V.).

P. simplarius n. sp. Cloudcroft (K.).

Cyphus lautus Lec. Deming (S.).

Aramigus tesselatus Say. Albuquerque (W.), Las Vegas (C.).

Phacepholis elegans Horn. Gallinas Canon (S.).

P. candida Horn. Walnut Creek (S.).

Cyphomimus ochreus n. sp. Common on scrub oak at Cloudcroft (K.).

Coleocerus marmoratus Horn. "Southern New Mexico" (cf. Townsend). In Arizona at Tucson (H. and S.).

CURCULIONIDÆ.

Sitones californicus Fah. Mesilla Valley (T.).

S. tibialis Hbst. Gallinas Canon (S.), Pecos (C.).

S. lineellus Gyll. Cloudcroft (K.).

S. sp. Rociada (C.).

Trichalophus arcuatus n. sp. Cloudcroft (V.), Beulah (C.).

Lepidophorus lineaticollis Kirby. Gallinas Canon (S.).

Apion occidentale Fall. Mesilla Valley (C.), Highrolls (V.).

A. acrophilum Fall. Santa Fé (Fenyes).

A. tenuirostrum J. B. Smith. Las Vegas, on *Petalostemon* (C.), Santa Fé Fenyes).

A. modestum J. B. Smith. Albuquerque (W.).

A. proclive Lec. Sacramento Mts. (K.).

A. griseum J. B. Smith. Thornton (Fenyes).

A. varicorne J. B. Smith. Las Vegas, on *Petalostemon* (C.), Sta. Fé (Fenyes).

A. alternatum Fall. Albuquerque (W.).

A. nasutum Fall. Albuquerque (W.).

A. segnipes Say. Albuquerque (W.).

A. decoloratum J. B. Smith. Las Vegas (C.).

A. solutum Fall. "New Mexico."

A. disparipes Fall. Santa Fé (Fenyes), Las Cruces (Hamilton collection), Wootens (K.).

Phytonomus setigerus Lec. Gallinas Canon (S.), Santa Fé (Fenyes).

Lepyrus colon L. "New Mexico."

Macrops vitticollis Kirby. Albuquerque (W.).

M. hirtellus Dtz. Coolidge (W.).

M. wickhami Dtz. Coolidge (W.).

M. sp. Las Vegas (C.).

M. sp. Top of Las Vegas Range, 11,000 ft. (C.).

M. sp. Santa Rosa (K.).

Pissodes strobi Peck. Ponil Canon, 9650 ft. (Miss Grace Eaton).

Lixus parcus Lec. Las Vegas, det. Wickham (C.).

L. læsicollis Lec. Mesilla Valley (C.), San Marcial (C.).

Dinocleus angularis Lec. "New Mexico" (Casey).

Cleonus (Stephanocleonus) plumbeus Lec. Top of Las Vegas Range, 11,000 ft. (C.), Beulah, prox. 8000 ft. (C.), Truchas Peak, above timber line (W. P. Cockerell). The only definite Colorado record for this species is La Junta, on the plains at 4000 ft. This seems extraordinary, as in New Mexico it occurred only from 8000 to 13,000 ft.

C. (Apleurus) pulvereus Lec. Santa Fé (C.), Albuquerque (W.), Walnut Creek (S.), Coolidge (W.), Las Vegas (C.), Pecos (C.).

C. (Apleurus) lutulentus Lec. Santa Fé (Fendler).

C. grandirostris Casey. Coolidge (W.), Las Vegas (Casey).

C. canescens Lec. Las Vegas (C.), Santa Fé (Fenyes).

C. trivittatus Say. Las Vegas, on *Astragalus simulans* (C.), Pecos (C.).

C. frontalis Lec. Gallinas Canon (S.).

C. quadrilineatus Chevrolat. Albuquerque (W.), Coolidge (W.).

C. vittatus Kirby. Gallinas Canon (S.).

Dorytomus brevisetosus Casey. Mesilla Park (C.), Chicorico Canon, near Raton, identity not certain (C.), Albuquerque (C.).

D. hispidus Lec. "New Mexico."

D. brevicollis Lec. Santa Fé Canon (S.).

D. sp. Sacramento Mts. (K.).

Procas lecontei Bedel. Walnut Creek (S.).

Desmoris constrictus Say. Gallinas Canon (S.), Albuquerque (W.), Mesilla Valley (C.), Santa Fé (C.), Pecos, on *Helianthus annuus* (C.), Wootens (K.), San Ildefonso (Wheeler Survey).

D. sordidus Lec. "New Mexico" (cf. Dietz).

D. fulvus Lec. Gallinas Canon (S.), Mesilla Valley (C.), Santa Fé (Fenyes), Tsuque (Fenyes).

Smicronyx ovipennis Lec. Las Cruces, at flowers of *Melilotus indicus* (T.).

S. mucidus Dietz. "New Mexico" (cf. Dietz).

S. spretus Dietz. Wootens (K.), Alamogordo (V.), Cloudcroft (V., K.).

S. abnormis Dietz. "New Mexico" (cf. Dietz).

S. rufulus Dietz. "New Mexico" (cf. Dietz).

Synertha imbricata Casey. Las Vegas (C.).

Phyllotrox nubifer Lec. Sacramento Mts. (K.), Cloudcroft (C.), Las Vegas Hot Springs (B. and S.).

P. quadricollis n. sp. Cloudcroft (V.), Beulah, on *Carduus parryi* (C.), Las Vegas Hot Springs (B. and S.).

P. sp. Cloudcroft (V.).

Endalus limatulus Gyll. Albuquerque (W.), Santa Rosa (K.).

E. n. sp. ? Santa Rosa (K.).

Bagous sp. Las Vegas (C.).

Otidocephalus vittatus Horn. Albuquerque (W.), Mesilla Valley (C.), Tularoso (C.), Embudo (C.), Mescalero (C.).

O. nivosus Casey. Mesilla Valley, on *Isocoma* (C.).

O. rhois n. sp. Rio Ruidoso (T.). Beaten from *Rhus glabra*.

O. estriatus Casey. Beulah (Skinner, Beyer), Las Vegas Hot Springs (B. and S).

Magdalis cuneiformis Horn. Gallinas Canon (S.), Santa Fé Canon (S.).

M. lecontei Horn. Gallinas Canon (S.), top of Las Vegas Range, 11,000 ft. (C.), Las Vegas Hot Springs (B. and S.), Sacramento Mts (K.).

M. gracilis Lec. var., or closely allied species. Pecos (C.).

M. alutaceus Lec. (?). Sacramento Mts. (K.), Las Vegas (C.), top of Las Vegas Range, 11,000 ft. (C.).

Macrorhoptus estriatus Lec. Albuquerque (W.).

M. hispidus Dietz. Roswell (C.), Santa Fé (Fenyes).

Tachypterellus quadrigibbus Say. Walnut Creek (S.), Dripping Spring, Organ Mts. (C.). *Tachypterellus* n. n. is *Tachypterus* Dtz. (not Guér., 1838).

Anthonomus bolteri Dietz. "New Mexico."

A. sycophanta Walsh. Sacramento Mts. (K.), Las Vegas Hot Springs (B. and S.).

A. albopilosus Dietz. Albuquerque (W.), Embudo, on *Croton* (C.), Santa Fé (Fenyes), Santa Rosa (K.).

A. æneolus Dietz. Mesilla, a gall supposed to be produced by this species, but doubtful (C.).

A. squamosus Lec. Gallinas Canon (S.), Las Vegas (C.), Pecos (C.), Santa Fé (Fenyes), Las Vegas Hot Springs (B. and S.).

A. tectus Lec. "New Mexico."

A. robustulus Lec. Las Vegas Hot Springs (B. and S.).

A. decipiens Lec. Beulah (Skinner).

A. canus Lec. Apache Spring, Socorro Co. (T.).

A. affinis Lec. "New Mexico."

A. nanus Lec. Albuquerque (W.), Las Vegas (C.), Santa Fé (Fenyes), Highrolls (V.).

A. lineatulus Dietz. Mesilla Valley (C.).

A. heterogenus Dietz. Santa Fé (Fenyes), Las Cruces (Fall coll.).

A. sp. Roswell (C.).

A. sp. Beulah (C.).

Pseudanthonomus validus Dietz. Las Vegas Hot Springs (B. and S.), "New Mexico" (cf. Dietz).

Epimechus curvipes Dietz. "New Mexico."

E. nanulus n. sp. Albuquerque (Fall coll.).

E. stragulus n. sp. Wootens (K.).

Elleschus ephippiatus Say. "New Mexico," Las Vegas Hot Springs (B. and S.).

Hypaleschus atratus n. g., n. sp. Beulah (C., Skinner).

Orchestes niger Horn. Gallinas Canon (S.).

O. rufipes v. *minutus* Horn. Pecos, on leaves of *Salix* (C.).

Tychius simplex Casey. Alamogordo (V.).

T. setosus Lec. Mesilla Valley (T.), Alamogordo (V.). In Arizona at Tucson (H. and S.).

T. subfasciatus Casey. Sacramento Mts. (K.).

Læmosaccus plagiatus Fabr. Gallinas Canon (S.), Sacramento Mts. (K.), Cloudcroft (V.).

Conotrachelus affinis Boh. Coolidge (W.).

C. nivosus Lec. Las Vegas (C.).

C. sp. near posticatus. Las Vegas Hot Springs (B. and S.). This is possibly Casey's *carinifer* or *integer*.

Rhyssematus lineaticollis Say. Gallinas Canon (S.), Santa Fé (Fenyes).

R. pubescens Horn. San Augustine Ranch (C.).

R. parvulus Casey. San Augustine Ranch (C.), La Cueva, Organ Mts. (T.).

R. pruinosus Boh. Mesilla Valley (C.), San Augustine Ranch (C.). In Arizona at Tucson (H. and S.).

Acalles turbidus Lec. Socorro (S.).

A. clathratus Lec. "New Mexico" (cf. Townsend).

A. indigens n. sp. Cloudcroft (W.).

Tyloderma baridium Lec. Beulah (Skinner list).

T. nigra Casey (= æreum Say ?). Las Vegas Hot Springs (B. and S.).

Zascelis irrorata Lec. Gallinas Canon (S.), Cloudcroft (V.), Highrolls (V.), Las Vegas Hot Springs (B. and S.).

Piazurus californicus Lec. Sacramento Mts. (K.), Las Vegas Hot Springs (B. and S.), Cloudcroft (V.).

Copturus (Cylindrocopturus) operculatus Say. Gallinas Canon (S.).

C. adspersus Lec. Albuquerque (W.). The insect reported from the Mesilla Valley as *adspersus* var. was presumably *cockerelli*.

C. adspersus v. *cockerelli* Casey. Las Cruces (C.).

Ceutorhynchus affluentus Dtz. Coolidge (W.).

C. notatulus n. sp. Pecos (C.).

C. decipiens Lec. Las Vegas (C.).

C. æratus Dietz. Sacramento Mts. (K.).

C. hornii Dietz. Alamogordo (V.).

C. pusio Mann. Sacramento Mts. (K.), Beulah (Skinner), Beulah, on *Sophio incisa* (C.).

C. pauxillus Dietz. "New Mexico."

C. convexicollis Lec. "New Mexico" (cf. Dietz, 1896).

Pelenomus cavifrons Lec. Pecos (C.).

Baris strenua Lec. Santa Fé (C.), Gallinas Canon (S.), Albuquerque (W.).

B. striata Say. Mesilla Valley (C).

B. aprica Casey. Sacramento Mts., a variety (K.).

B. n. sp. (?) aff. *macra*. Cloudcroft (V.).

Stictobaris cribrata Lec. Gallinas Canon (S.).

S. subacuta Casey. Mesilla Park (C.).

Onychobaris mystica Casey. "Southern New Mexico" (cf. Townsend). In Arizona at Tucson (H. and S.).

O. ambigua Casey. Mesilla Park, identity doubtful (C.).

O. distans Lec. "New Mexico." Also an undetermined sp. from Pecos (C.).

Desmoglyptus crenatus Lec. Lone Mtn., on *Vitis* (C.).

Pseudobaris lugubris Casey. Albuquerque (W.).

P. cælata Casey. Albuquerque (W.).

Pycnobaris squamotecta Casey. Santa Rosa (K.).

Trichobaris texana Lec. Mesilla (C.); Sacramento Mts. (K.).

T. trinotata Say. Mesilla Valley (C.). (This was perhaps *compacta*.)

T. compacta Casey. Mesilla, on *Datura meteloides* (C.), Organ Mts. (T.).

Orthoris crotchii Lec. Gallinas Canon (S.). Pecos (C.). In Arizona at Tucson (H. and S.).

Centrinus neglectus Lec. Gallinas Canon (S.).

C. exulans Casey. Gallup (W.).

C. acuminatus Casey. Mesilla Valley (C.).

Calandrinus grandicollis Lec. Las Vegas (C.), Wiegand Ranch, near Las Vegas (C.).

C. obsoletus Casey. Ancho (K.).

Limnobaris limbifer Casey. San Geronimo, identity doubtful (W. P. Ckll. and Mary Cooper).

Balaninus nanulus Casey. Las Vegas (Casey), Fillmore Canon, Organ Mts. (C.), La Cueva, Organ Mts. (T.). The Organ Mts. insect is doubtfully referred to *nanulus*; Mr. Schwarz was of the opinion that it belonged to *B. obtusus* Blanch.

B. uniformis Lec. Santa Fé Canon (S.).

B. nasicus Say. Water Canon (S.).

B. strictus Casey. Las Vegas (Casey).

B. sulcatulus Casey. Las Vegas (Casey).

B. brevirostris Casey. Las Vegas (Casey).

B. sp. Beulah (C.).

B. sp. S. W. Truchas Peak, above timber line (W. P. Ckll.), Cloudcroft (K.).

[There is little doubt that these last two species are identical with some of those named above, and it is quite as probable that we have more names than species.]

CALANDRIDÆ.

Scyphophorus acupunctatus Gyll. North of Silver City (C.), Grant Co. (Howard), La Cueva, Organ Mts. (T.).

Rhodobænus tridecimpunctatus Ill. Albuquerque (W.), Roswell (C.), San Ildefonso (Wheeler Surv.).

R. pustulosus Gyll. Walnut Creek (S.), Grant Co. (Howard).

Sphenophorus vomerinus Lec. Gallup (W.), Albuquerque (C.).

S. ulkei Horn. Santa Fé Canon (S.), Santa Fé (C.), Coolidge (W.), Las Vegas (C.), Beulah (C.), Las Vegas Hot Springs (C.).

S. callosus Ol. Grant Co., injuring corn (cf. Chittenden, Yearbook of Dept. Agr. for 1904, p. 601), also injuring corn on Gila River.

S. neomexicanus Chitt. Albuquerque (Soltau).

S. reticulaticollis Bohem. Albuquerque (Soltau).

S. fallii Chitt. Santa Fé.

S. sp. Santa Rosa (K.).

Calandra oryzæ L. Mesilla (C.).

C. remotepunctata Gyll. Between Santa Fé and Fort Wingate (Wheeler Survey).

C. granaria L. Mesilla Valley (C.).

Cossonus subareatus Boh. Beulah, identity doubtful (Skinner).

C. concinnus Boh. Gallinas Canon (S.), Santa Fé Canon (S.), Eagle Creek (T.), Beulah (Skinner).

C. crenatus Horn. Cloudcroft (K.).

Parahornia quercicola Horn. Las Vegas Hot Springs (B. and S.).

Rhyncholus brunneus Mann. Santa Fé Canon (S.).

R. nimius Casey. Las Vegas (Casey), Las Vegas Hot Springs (B. and S.). The last mentioned insect is perhaps not *nimius*, though agreeing well with the description. It is scarcely at all different from Californian examples of *oregonensis*, and it may be that *nimius* is only a synonym of the latter.

SCOLYTIDÆ.

Gnathotrichus sulcatus [Hopk. MS. ?] Beulah (Skinner).

G. retusus Lec. Gallinas Canon (S.), Sacramento Mts. (K.).

G. materiarius Fitch. Cloudcroft (V.).

Pityophthorus carinulatus Lec. Las Vegas (C.).

P. carinulatus v. *hamatus* Lec. Coolidge (W.).

P. nitidulus Mann. Top of Las Vegas Range, 11,000 ft. (C.), Cloudcroft (K.), Cloudcroft, identity doubtful (V.).

P. sp. Cloudcroft (V.).

P. puncticollis Lec. Walnut Creek (S.).

P. n. sp. Lone Mtn., breeding in walnut bark (C.).

Xyloterus lineatus Oliv. Gallinas Canon (S.), Sacramento Mts. (K.).

X. scabricollis Lec. Gallinas Canon (S.).

Dryocœtes septentrionis Mann. Ponil Canon (Miss Grace Eaton).

Xyleborus xylographus Say. Walnut Creek (S.).

Xylocleptes cucurbitæ Lec. Mesilla, in dead stems of *Cucurbita fœtidissima* (C.).

Tomicus calligraphus Germ. Beulah (Skinner).

T. plastographus Lec. Gallinas Canon (S.), Coolidge (W.), Sacramento Mts. (K.), Cloudcroft (V.), Beulah (Skinner), Las Vegas Hot Springs, identity doubtful (C.).

T. integer Eich. New Mexico (cf. Hopkins).

T. rectus Lec. Gallinas Canon (S.). Beulah (Skinner).

T. oregoni Eich. Las Vegas, det. Hopkins (Lawrence Tamme).

Scolytus unispinosus Lec. Cloudcroft, identity doubtful (V.).

S. californicus Lec. Gallinas Canon (S.), Santa Fé Canon (S.).

S. præceps Lec. Sacramento Mts. (K.), Beulah (Skinner).

S. sp. Alamogordo (V.), Cloudcroft.

Chramesus icoriæ Lec. Coolidge (W.).

Polygraphus rufipennis Kirby. Beulah (Skinner).

Phlœotribus liminaris Harris. Santa Fé (C.), Mesilla Valley, a variety (C.).

Hylesinus aculeatus Say. Coolidge (W.).

Phlœosinus serratus Lec.? Pecos (C.).

Dendroctonus valens Lec. Gallinas Canon (S.), Albuquerque (W.), Santa Fé Canon (S.), Sacramento Mts. (K.), Coolidge (W.), Rio Ruidoso (T.), Eagle Creek (T.), Cloudcroft (V.), Beulah (Skinner).

D. similis Lec. Gallinas Canon, a variety (S.), Walnut Creek (S.), Sacramento Mts. (K.).

D. simplex Lec. Gallinas Canon (S.).

D. piceaperda Hopk. var. Cloudcroft (V.).

D. piceaperda v. *engelmanni* Hopk. Top of Las Vegas Range 11,000 ft. (C.).

D. parallelocollis approximatus Dietz. "New Mexico." Breeds in *Pinus*. Cloudcroft (V.).

D. ponderosæ Hopk. Near Vermejo (Hopkins, Bull. 56, Bureau of Ent. p. 7).

Hylastes longus Lec. Gallinas Canon (S.), Albuquerque (W.), Coolidge (W.), Gallup (W.).

H. gracilis Lec. Santa Fé Canon (S.).

H. sp. Rio Ruidoso (T.).

H. n. sp. Beulah (Skinner), Cloudcroft (V.).

Hylurgops rugipennis Mann. Gallinas Canon (S.), Santa Fé Canon (S.), Coolidge (W.), Cloudcroft (K.).

H. subcostulatus Mann. Sacramento Mts. (K.), Beulah (Skinner), Cloudcroft (V.).

ANTHRIBIDÆ.

Allandrus bifasciatus Lec. Gallinas Canon (S.), Harvey Ranch, Las Vegas Range (Ruth Raynolds), Sacramento Mts. (K.).

Brachytarsus griseus Lec. Wootens (K.). In Arizona at Tucson (H. and S.).

Anthribulus rotundatus Lec. Coolidge (W.).

DESCRIPTIONS OF NEW SPECIES

BY H. C. FALL.

In the following pages descriptions have been drawn up of as many of the new species as it was possible to fix the standing of with reasonable certainty. There still remain numerous forms, some unquestionably new, others of doubtful status, a full investigation of which is not now practicable. A number of allied species, chiefly from adjacent or other regions of the southwest, have been included for the sake of concentration of treatment.

CARABIDÆ.

Tachys cockerelli n. sp.—Elongate, moderately convex, uniformly pale rufous in color. Prothorax slightly wider at base than at apex, the posterior transverse impression not tripunctate. Elytra with three well-marked striæ and more or less evident traces of a fourth and fifth; the outer ones more abbreviated as usual and all completely impunctate. Length 2–2.5 mm.

New Mexico (Romeroville). Numerous specimens taken by Prof. Cockerell, to whom it gives me pleasure to dedicate the species.

By Hayward's table *cockerelli* would fall next to *dolosus*, from which it differs by its slightly darker color, more transverse prothorax and pluri-striate elytra. The posterior dorsal puncture seems uniformly farther behind the middle of the elytra than in *dolosus*.

STAPHYLINIDÆ.

Staphylinus modestus n. sp.—Most nearly allied to *fossator* and *cinnamopterus*, with the latter of which it agrees closely in form and size. The color is nearly uniformly black in mature specimens, the tibiæ and tarsi brownish, but in some examples the elytra are in part obscurely ferruginous. Head subtriangular, nearly equal in width to the prothorax, sides feebly convergent in front; prothorax not at all narrowed anteriorly, densely not coarsely punctate and with only a slight trace of a smooth median line near the hind margin. Abdomen without well-defined double line of velvety spots, which are, however, very faintly indicated in some specimens. Length 11–12 mm.; width 2.25–2.5 mm.

New Mexico, Santa Fé (Fenyes), and Las Vegas (Cockerell).

As compared with *fossator*, *modestus* is a distinctly smaller and more slender species, the sculpture a little finer, median smooth line of pronotum almost completely wanting, sides of prothorax more nearly straight and not at all convergent in front (usually more or less obviously so in *fossator*), elytra entirely without violaceous tint or apical spots. From *cinnamopterus*, *modestus* differs in its finer, much denser punctuation of the prothorax, as well as in color. *Tomentosus* is also nearly allied, but in this the color is perfectly black throughout, the pubescence blacker, and the velvety spots on the upper surface of the abdomen are conspicuous.

EUÆSTHETUS Grav.

The discovery of a species of this genus at Las Vegas by Prof. Cockerell is notable as being the first instance of its occurrence in the Rocky Mountain region. The species are all minute, difficult to separate, because of the lack of salient characters, and are poorly represented in the majority of collections. The species described below is one of the largest in the genus, being equaled in size only by *punctulatus* according to Casey's measurements, and there can be little doubt that it is quite distinct from any of the eastern species.

E. neomexicanus n. sp.—Form rather robust, color uniformly rufocastaneous above, the metasternum darker. Head across the eyes subequal in width to the prothorax, the latter of the usual form and widest slightly in advance of

the middle. Elytral suture just visibly shorter than the prothorax, the sides a little divergent posteriorly. Abdomen at base subequal in width to the elytra, the margin quite strong on the fourth segment, but very fine on the fifth. Head and prothorax shining, the punctures moderate in size, distinct on the latter by about their own diameters on the average, closer on the head except along the median line. Elytra a little dull, very finely and sparsely punctate, the punctures barely visible in the sutural region. Abdomen finely alutaceous and dull, excessively minutely punctulate. Length 1.5-1.6 mm.

Described from one pair (♂, ♀) taken at Las Vegas in February.

Following the characters used in Casey's table, *neomexicanus* would stand with *similis* and *mundulus*, both of which are smaller and more slender. In *similis* the sides of the elytra are strongly divergent, the border of the fifth ventral is said to be strong and the metasternum is concolorous with the remainder of the lower surface. In *mundulus* the lateral border of both the fourth and fifth segments is nearly obsolete. Both *similis* and *mundulus* occur in the extreme eastern part of the country.

Heterothops mediocris n. sp.—Testaceous, head darker. Head narrow; eyes moderate, distance from their posterior margin to the nuchal constriction less than twice their length; setigerous punctures of the sides of the head as in *occidentis*, viz.—one at the middle of the upper margin of the eye, another below the posterior margin of the eye, about halfway between it and the infraorbital ridge, and two others arranged transversely near the nuchal constriction. Antennæ nearly as in *occidentis*, the third joint about two-thirds as long as the second, eleventh as long as the two preceding. Form slightly stouter, but otherwise nearly as in *occidentis*. Length 2 mm.

Described from three closely similar examples—2 ♂'s, 1 ♀—taken by Barber and Schwarz at Las Vegas Hot Springs, and by the writer at Riverside, California.

This species is intermediate between *pusio* and *occidentis*. As compared with *pusio* it is a little smaller and evidently less stout, quite different in color, with smaller eyes, and with no setigerous puncture at the postero-superior margin of the latter. As compared with *occidentis* the form is a trifle less slender, the color is similar except for the darker head of the present species, and the eyes are much larger, these being abnormally small in *occidentis*. The last ventral of the male is deeply triangularly emarginate, the notch nearly as deep as wide, the sides nearly straight, and with well defined outer angles.

Neomedon piciventre n. sp.—Robust, subdepressed, reddish-brown, the abdomen blackish. Head large, transversely quadrate behind the eyes, the sides parallel, the hind angles narrowly rounded; base sinuato-truncate; surface

distinctly alutaceous, with rather coarse rounded punctures which are separated by about their own diameters. Prothorax slightly narrower than the head, obviously transverse, sides straight and moderately convergent behind; sculpture similar to that of the head, except that the punctures are somewhat finer; median line narrowly smooth and very finely subobsoletely sulcate. Elytra subequal in width to the head, evidently longer than wide, surface scarcely at all alutaceous, the punctures finer and less close than on the pronotum. Abdomen very finely but not closely punctate. Length 6 mm.; width 1.4 mm.

Described from a single pair taken at Cloudcroft by Mr. Knaus. The male type has the sixth ventral broadly feebly emarginate. This species must be closely related to *arizonense* Csy., to which I refer a specimen taken by Townsend in the White Mountains (New Mexico). This latter is larger, with head and prothorax blackish like the abdomen, and the third antennal joint is fully twice as long as the second and distinctly constricted at middle. In *piciventre* the third joint is distinctly less than twice as long as the second and not at all constricted.

Stilicus oblitus n. sp.—Piceous, the extreme apical margin of the elytra obscurely paler; legs and antennæ rufotestaceous. Head dull, the punctures dense, rather coarse, and more or less longitudinally confluent; beneath coarsely densely punctate; sides parallel for a short distance behind the eyes, then broadly rounded; base truncate; labral teeth very long and acute. Prothorax, as defined by the angles, subquadrate, the sides just visibly converging posteriorly; surface densely confluently punctate, median line finely canaliculate. Elytra just visibly longer than the prothorax, equal in width to the head, the punctuation rather fine and not close, surface moderately shining. Abdomen finely sparsely punctate and somewhat shining. Length 4 mm.

Beulah, May 3 (Cockerell).

The type is a male, having the fifth ventral segment unmodified, the sixth with a subtriangular emargination which is somewhat wider than deep, and narrowly rounded at apex. The species is related to *rudis* in sculpture, but has a very differently shaped head.

Palaminus amplipennis n. sp.—Yellowish testaceous, the abdomen slightly darker. Size, sculpture and vestiture throughout nearly as in *P. testaceus*, from which and all previously described forms it differs in its broader and longer elytra; these being one-half wider than the prothorax and about twice as long.

Pecos. Collected by Prof. Cockerell.

The type is doubtless a female, and has the terminal ventral segment completely devoid of any trace of an emargination. It should stand near *normalis*, which of all our species approaches it most nearly in size of elytra.

COCCINELLIDÆ.

Hyperaspis hæmatosticta n. sp.—Broadly oblong-oval, black; head, front margin of prothorax very narrowly, and side margin more broadly, yellow; elytra with median and subapical spot—the latter sometimes wanting—red. The discal spot is rounded or broadly oval and is almost exactly at the middle of the length, but is nearer the suture than the side margin, the distance from the suture being less, and that from the margin greater than its own width. The subapical spot is smaller, nearly equally distant from the suture and apex. Sides of ventral segments narrowly yellow; legs black in the female, the front ones in great part pale in the male. Length 3-3.5 mm.; width 2.2-2.4 mm.

Santa Fé. Three examples taken by Dr. Fenyes.

This species resembles a large *signata*, but the latter is relatively broader and more rounded, rather more coarsely punctured, and with the median spot slightly more anterior in position and nearer the margin than the suture.

CUCUJIDÆ.

Narthecius monticola n. sp.—Head, including the mandibles, distinctly longer than wide and subequal in length to the prothorax; surface feebly shining and minutely sparsely punctulate, occiput very broadly feebly impressed with a fine line at middle half the length of the head; supraorbital ridges extending behind the eye a distance which is obviously less than the length of the eye; the distance from the eye to the nuchal constriction barely equal to the diameter of the eye. Antennæ reaching fully to the middle of the prothorax, the basal joint short and stout, but little longer than wide; median process of epistoma narrowly, parabolic, the apex subtruncate. Prothorax of the usual form, surface dull and sparsely very finely punctulate, the punctures nearly even in size and distribution; disk vaguely broadly impressed along the median line. Elytra distinctly longer than the head and thorax together, without visible sculpture other than the fine costæ. Length 2.5 mm.

Described from a single specimen taken by Mr. Knaus at Cloudcroft (9000 ft.). This species is, by the form of the epistoma, allied to *breviceps* Casey and should precede that species in the table given by Casey—Annals N. Y. Acad. Sci., V, 1890, p. 322. The larger size, longer head, and relatively longer elytra of the present species should easily distinguish it.

Narthecius striaticeps n. sp.—Head without the mandibles equal in length to the prothorax and plainly longer than wide; epistomal process bifid; front finely punctate, the entire surface posterior to the base of the antennæ rather strongly longitudinally strigose; occiput not at all impressed; supraorbital ridge extending behind the eye a distance scarcely equal to the diameter of the latter; nuchal constriction feeble, distant from the eye about one-third more than its diameter. Antennæ nearly attaining the middle of the prothorax, basal joint much longer than wide. Prothorax narrowed behind as usual, disc a little

flattened along the median line, punctuation moderately close and rather fine, the punctures tending to coalesce in short rugæ toward the anterior angles. Elytra almost exactly equal in length to the head and prothorax united; punctures between the costæ very fine but usually evident. No sexual differences are detectable in the numerous examples seen. Length 2.5–3.3 mm.

This is the species referred to as *grandiceps* in my list of the Coleoptera of Southern California. The latter species was described from Pennsylvania, and is quite surely distinct if correctly defined by Casey. The five species now known to us may be separated as follows:

Median apical process of epistoma bifid at apex.
  Head longitudinally strigose or aciculate, and more or less evidently longer than the prothorax.
    Antennæ scarcely as long as the head; nuchal constriction distant from the eye by nearly twice the length of the latter, elytra shorter than the head and prothorax together (Pennsylvania) ..... **grandiceps.**
    Antennæ plainly though not greatly longer than the head; nuchal constriction distant from the eye by less than one and one-half times the diameter of the latter; elytra equal in length to the head and thorax together (Southern California) ..... **striaticeps.**
  Head not strigose and shorter than the prothorax; elytra longer than the head and prothorax together (Middle California)..... **simulator.**
Median apical process of epistoma truncate or subtruncate at apex.
  Head subequal in length to the prothorax; elytra longer than the head and prothorax together; punctuation very fine (New Mexico). **monticola.**
  Head shorter than the prothorax; elytra equal in length to the head and prothorax together; punctuation stronger (Florida)..... **breviceps.**

NITIDULIDÆ.

Epuræa alticola n. sp.—Broadly obtusely oval, pale rufotestaceous, shining, sparsely pubescent. Head moderately punctate, the punctures separated by about their own diameters. Antennæ rufotestaceous, club slightly darker; third joint scarcely twice as long as wide, fourth and fifth equal and slightly longer than wide, sixth as wide as long, seventh and eighth transverse, the latter strongly so; club broadly oval, its first and last joints subequal in length, each about two-fifths the entire length of the club; antennal grooves confluent behind, not very sharply impressed. Thorax about twice as wide as its length on the median line, widest a little before the base, sides thence broadly arcuate and convergent to apical angles; just visibly sinuate before the hind angles, which are sharply defined and slightly obtuse; disk evenly not very closely punctate, side margins rather broadly reflexed. Elytra scarcely one-sixth longer than wide, sides feebly arcuate, apex broadly truncate and subequal in width to the base, side margins rather narrowly reflexed; punctuation similar to that of the head and thorax. Beneath moderately closely punctate; intercoxal process broad, obtuse. Length 2.5 mm.; width 1.5 mm.

Described from a single male taken by Prof. Cockerell at an altitude of 11,000 ft. in the Las Vegas Range.

There are no apparent sexual modifications of the legs, but the first ventral bears at the middle two longitudinal parallel lines of erect hairs, a character which will at once distinguish the present species from any other in our fauna; the truncation of the elytra is also more pronounced than in any other species known to me. *Alticola* may follow *ovata* in Horn's table.

MONOTOMIDÆ.

Europs striatulus n. sp.—Form of *longicollis* but smaller and somewhat paler in color; antennal club subequal in length to the six preceding joints united (about equal to the four preceding in *longicollis*). Head and prothorax less closely but relatively quite as coarsely punctate as in *longicollis*; tempora about one-third the diameter of the eye; prothorax just visibly narrower posteriorly, punctuation sparser along the median line which is, however, not at all impressed; elytra very finely striate, the striæ finely punctate, interspaces relatively wider than in *longicollis*. Beneath very sparsely punctate, the punctures rather coarse on the sterna, but quite minute on the abdomen. Length 2 mm.

A single example, collected by Mr. Knaus at Cloudcroft, is all that is known to me of this quite distinct species. It may be at once known from either of our two previously described species by its small size and finely striate elytra. In neither *pallipennis* nor *longicollis* are the elytra truly striate, the rows of punctures merely occupying at most very feebly defined grooves.

Since writing the above, other examples have been seen, collected by Barber and Schwarz at Las Vegas Hot Springs. Some of these specimens are larger than the above measurement.

BYRRHIDÆ.

Pedilophorus subsetosus n. sp.—Broadly nearly evenly elliptical, greenish-bronzed, shining, vestitute moderately plentiful but not dense, consisting of subrecumbent pale hairs, numerously interspersed throughout with short slightly coarser less inclined pale setæ, which are rather inconspicuous, but plainly evident in profile, especially on the elytral declivity. Antennæ black, gradually clavate as usual, the seventh joint about as wide as long. Entire upper surface uniformly punctate, the punctures a little sparser on the vertex, but elsewhere separated by about their own diameters. Sides of prothorax straight, faintly sinuate at middle, angles acute. Entire lower surface including the legs piceous, densely, quite coarsely punctate; tarsi not lobed. Length 4½ mm.; width 2 4-5 mm.

Kalispell, Montana (Wickham).

This species by its non-lobed tarsi would be associated with *aneo-*

lus Lec., with which, so far as can be judged by LeConte's brief description, it agrees fairly well in other characters, except in form of body, which is said to be obliquely attenuate in front and obtusely rounded behind in *æneolus*. In his short but comprehensive review of the North American species of *Pedilophorus* (Can. Ent., June, 1903, p. 179), Mr. Wickham refers his specimens doubtfully to *æneolus*, but if LeConte's description is trustworthy I think they must be regarded as distinct.

Pedilophorus subcupreus n. sp.—Broadly oblong-elliptical, dark cupreo-æneous, pubescence very short, fine, sparse and recumbent. Head coarsely rather closely punctate throughout. Prothorax with sides nearly straight, hind angles distinctly acute, front angles only slightly less than right; surface more finely and sparsely punctured than the head, the punctures distant from two to four times their own diameters at the middle, becoming closer and slightly larger at sides; a distinct foveiform depression within the hind angles. Elytra punctured like the thorax. Beneath piceous, densely punctate and pubescent as usual; third tarsal joint lobed. Length 5.6 mm.; width 3.3 mm.

Washington (Aberdeen). A single specimen.

This species should come between *acuminatus* and *oblongus* in Wickham's table. It is larger and relatively wider than *oblongus*, and differs from *acuminatus* in not being at all acuminate posteriorly and in its finer punctuation. The ventral punctures in *acuminatus* are conspicuously coarser and less numerous, there being only two or three punctures in the length of a segment, while in *subcupreus* there are about six.

Pedilophorus lateralis n. sp.—Moderately broadly oblong-elliptical, blackish, with feeble green-bronze lustre, shining, clothed with recumbent black hairs, which become predominantly mingled with white and brown laterally, inclosing at the sides of the elytra a conspicuous dark spot. Antennæ black, sixth joint as wide as long, seventh distinctly transverse, eighth to tenth strongly transverse. Head moderately closely strongly punctate, a smooth spot at the middle of the vertex, but no frontal fovea. Prothorax nearly as wide as the elytra, sides nearly straight, angles acute, surface deeply but not coarsely punctate, the punctures separated by a little more than their own diameters at the middle, becoming slightly larger and closer laterally. Elytra with sides parallel and very feebly arcuate in basal two-thirds, punctuation similar to that of the thorax. Beneath rufopiceous, densely rather coarsely punctate, with recumbent ochreo-cinereous pubescence; tarsi not lobe. Length 4 mm.; width 2 2.5 mm.

Described from a single example taken by Prof. Cockerell near Las Vegas (head of Daily Canon), June.

This also by its simple tarsi is allied to *æneolus*, but differs conspicuously from both it and *subsetosus* by its differently colored and disposed vestiture.

PARNIDÆ.

Elmis pecosensis n. sp.—Elongate-ovate, distinctly wider behind, black, shining, with very faint violaceous lustre, tarsi pale. Antennæ entirely testaceous, last three joints equal in length to the six preceding. Prothorax wider than long, sides convergent from the basal angles, before which they are faintly sinuate, broadly rounded at basal third, thence more strongly convergent to the acute apical angles; disk evenly feebly convex without median channel, moderately strongly punctured, the punctures separated by their own diameters or slightly more; basal plica parallel with the margin and nearly attaining the middle; sides exterior to the plica subrugose. Elytra slightly more than one-half longer than wide, at base very little wider than the prothorax, humeri small but evident, sides diverging to apical two-fifths, striæ distinctly though not deeply impressed, punctures rather strong; interstices feebly convex, evidently but sparsely irregularly punctate. Beneath rufopiceous, densely ochreo-cinereous, sericeous pubescent. Length 2.5 mm.; width 1.1 mm.

Pecos. One example (Cockerell).

Of the described species this is apparently nearest to *corpulentus* Lec. The latter from the description is of stouter build, greenish-black, the prothorax scarcely punctate and feebly channeled, the antennæ blackish at tip, legs testaceous. All other species allied to the present one have the elytra maculate, except *divergens*, which is distinctly different by its more parallel form and greenish-black color.

The maculation of the elytra is probably not entirely constant, at least one example thus marked is associated with the otherwise uniformly colored *corpulentus*.

Elmis addendus n. sp.—Moderately stout, subovate, black, shining, scarcely at all pubescent. Antennæ testaceous, last joint becoming piceous at apex; ninth similar to the eighth and scarcely larger; eleventh as long as the two preceding united and just visibly wider. Prothorax distinctly transverse, sides nearly parallel in basal third, faintly sinuate before the hind angles, broadly rounded and convergent anteriorly; lateral elevated line extending from base to apex, disk between the carinæ finely punctate, feebly transversely impressed before the middle, punctures distant from two to three times their own diameters; spaces between the carinæ and side margin opaque, punctures not defined, an oblique carina extending forward from the hind angles for about two-fifths the thoracic length. Elytra wider behind, striæ evidently impressed and rather strongly punctured, intervals minutely sparsely punctulate. Lower surface paler, pubescent and finely punctate as usual; legs rufous. Length 2.25 mm.; width 1.2 mm.

Pecos. Two examples (Cockerell).

The tips of the humeral umbones are dull rufous in one example, but it is not likely that the elytra ever become truly maculate.

From the described species having entire thoracic carinæ and shining surface, the present differs in the absence of lateral elevated lines on the elytra. It should precede *glaber* on our lists.

Elmis antennatus n. sp.—Stout, ovate, black, feebly bronzed, shining, sparsely ochreo-pubescent, the alternate elytral intervals more distinctly so. Antennæ testaceous, becoming piceous at tip; 10-jointed, first and second joints stouter, third twice as long as wide, 4-7 feebly obconic and slightly longer than wide; 8-10 forming a distinct club not quite as long as the five preceding joints; eighth joint similar in form to the seventh but larger, ninth about as wide as long, tenth elongate-oval, pointed. Prothorax a little wider than long, sides rather strongly convergent from the base, broadly rounded at middle and somewhat sinuate both before and behind; hind angles slightly acute, front angles strongly so; disk distinctly channeled at middle, basal plica moderate, not reaching the middle, side margins narrowly granose, punctuation very fine and sparse, punctures distant from three to five times their own diameter. Elytra broadly subovate, striæ slightly impressed and moderately punctured; interspaces broad, nearly flat, sparsely punctulate. Beneath pale, finely densely pubescent. Legs testaceous, the thighs darker. Length 2.75 mm.; width 1.4 mm.

Described from two examples taken at Beulah in August by Prof. Cockerell. In both specimens the last ventral segment is broadly emarginate at apex, possibly a male character.

This is the first species to be made known with 10-jointed antennæ. The structure otherwise seems closely in agreement in all essentials with typical *Elmis*.

ELATERIDÆ.

Limonius sinuifrons n. sp.—Dark brown, shining; pubescence grayish, moderately conspicuous. Antennæ surpassing by two joints the hind angles of the prothorax; second and third joints small, the third very slightly longer and more triangular; fourth joint widest, about twice as long and nearly twice as wide as the third, outer angle acute. Head closely strongly punctate, front broadly concave, margin well produced, rather deeply sinuate at middle, feebly reflexed laterally. Prothorax longer than wide, moderately narrowed in front, sides feebly arcuate, faintly sinuate before the hind angles. Surface strongly closely punctate at sides, the punctures becoming a little smaller and more remote at middle, where they are separated from one to two times their own diameters; hind angles short, scarcely divergent, carinate. Elytra finely striate, striæ finely punctate, intervals rather wide, flat on the disk, a little convex laterally, numerously finely punctate. Beneath strongly and closely punctate anteriorly, more sparsely on the metasternum and abdomen; flanks of prothorax beneath without trace of smooth space posteriorly; first joint of hind tarsi much shorter than the next two. Length 11¾ mm.; width 3¼ mm.

Arizona (Williams). A single example is before me collected by Barber and Schwarz.

This species is about the size of an average *griseus*, but is a trifle more slender, with less conspicuous pubescence, longer antennæ, with a much greater disparity between the third and fourth joints.

Athous nugalis n. sp.—Brown or piceous-brown, extreme margins of clypeus, prothorax—especially the hind angles—and elytra including the suture, more or less evidently but indefinitely paler; antennæ, legs and margins of ventral segments more obviously paler; pubescence short, brownish-gray, rather inconspicuous; form moderately slender. Antennæ (male) about two and one-half joints longer than the prothorax, second joint one-third as long as the third, the latter slightly but visibly longer than the fourth; third and fourth joints widest, the latter three-fourths as wide as long. Head strongly closely punctured, front moderately deeply impressed. Prothorax about one-fifth longer than wide, base but little wider than the apex, sides very broadly arcuate, a little sinuate before the hind angles, which are short and scarcely or but sligthly divergent; surface polished and closely punctate, the punctures rather coarse, distinctly umbilicate and nearly in mutual contact at sides; a little finer at middle, where they are separated as a rule by from one-quarter to three-quarters their own diameters; hind angles carinate. Elytra finely striate, interspaces nearly flat and finely punctate. Punctuation and pubescence beneath as usual; first joint of hind tarsus nearly equal to the next three; tarsal lobes very small and indefinite. Length 10-12 mm.; width 2.8-3.3 mm.

Southern California—San Bernardino Mts. and elsewhere in the Southern Sierras and adjacent foothills.

The above description is drawn from the male, the female differing in the usual way, viz.: the somewhat broader form, more convex prothorax, with sides more strongly rounded, and the shorter antennæ.

Structurally *nugalis* is very close to what I have interpreted as *nigripilis* Mots. The latter is entirely black or very nearly so, the form slightly stouter, the frontal impression more sharply defined and more obviously triangular in outline, the prothorax with a very narrow, incomplete, smooth, median line, which is never at all indicated in *nugalis*. *Nigripilis* is a common species in the coast region from the vicinity of San Francisco to Oregon, and probably farther north. Specimens in my collection from Kaweah and Yosemite are doubtfully referred to *nugalis*. These in their darker color and form approach *nigripilis*. Others from Sylvania are equally puzzling, but are for the present placed with *nigripilis*. It is probable that one or two distinct but closely allied species are here involved, but their definition is not possible with the material at hand.

Athous recticollis n. sp.—Similar to the preceding, except in following particulars: antennæ more slender, the fourth joint but slightly more than half as wide as long, frontal impression deeper and more sharply defined, distinctly triangular in outline; prothorax narrower, the sides not in the least arcuate at middle, straight or just visibly sinuate from the hind angles almost to the anterior margin; punctuation coarser and a little less close than in *nugalis*.

California, Tuolumne Co. and Lake Tahoe.

The type is a male from the first named locality. Two females from Lake Tahoe are associated with some confidence. They have the coarser pronotal punctuation as in the type, and the sides of the prothorax, while somewhat arcuate, are less strongly so than in females of *nugalis*.

Athous speculifer n. sp.—This name is proposed for a small black species agreeing very nearly in all respects with *nigripilis*, but differing from it and every other species of *Athous* known to me in having an oval polished impunctate area on each side the median line of the prothorax. These impunctate areas are a little in advance of the middle, occupy a little less than one-third the pronotal length and are separated by about their own width, the space between them and elsewhere being normally closely punctate. Length 9.5 mm.; width 2.5 mm.

Tacoma, Washington. A single example collected by myself in July.

The third tarsal joint is produced in a short narrow lobe; fourth joint not distinctly lobed.

Athous quadricollis n. sp.—Moderately slender, piceous-brown, antennæ and lower surface somewhat paler; pubescence pale, moderately plentiful. Second joint of antennæ about two-thirds the length of the third, the latter two-thirds as long as the fourth; fourth joint widest, nearly twice as wide as the third and about two-thirds as wide as long, outer angle rounded. Front broadly concave from side to side, head closely punctate. Prothorax as wide as long or virtually so, widest with the sides very broadly rounded just behind the middle, very feebly sinuate posteriorly, the angles scarcely at all divergent; straight and just visibly sinuate anteriorly; surface rather finely punctate, the punctures simple and separated by from one to two or more times their own diameters at the middle, a little closer laterally, becoming umbilicate only near the margins; hind angles with a very short fine carina. Elytra and lower surface about as usual. First joint of hind tarsi evidently longer than the next two; third joint with a moderately developed broad lobe; fourth joint not lobed. Length 11½ mm.

California (Lake Tahoe); one male.

A second male from an unrecorded locality has the pronotum minutely longitudinally strigulose and with a fine median impressed line; this sculpture is unusual and perhaps accidental. The short prothorax, form of frontal impression, and relative dimensions of joints 2–4 of the antennæ distinguish this species at once from any of the preceding.

Athous palpalis n. sp.—Dark form, elytra slightly paler, pubescence pale, conspicuous. Similar to *quadricollis* in its broadly impressed front and in antennal formation, joints 2–4 increasing in length, the fourth much wider than

the third. Prothorax about one-tenth longer than wide, finely, simply punctate throughout, the punctures separated by about their own diameters laterally, scarcely finer and separated by from one to three times their diameters at middle; median line vaguely impressed throughout, hind angles not distinctly carinate. Terminal joint of maxillary palpi more slender than usual, the arcuately oblique apical edge much shorter than the inner side. Third and fourth tarsal joints with narrow feeble lobes. Length 10 mm.; width 2.5 mm.

Oregon (Medford); one example, apparently a male.

A second specimen from Humboldt Co., California (Van Dyke), is paler in color and more slender, but agrees otherwise. In all the other species of the genus examined by me the oblique apical edge of the last joint of the maxillary palpi is as long as or even longer than the inner side.

Athous discors n. sp.—Slender, blackish, legs piceous to rufous, elytra moderately shining, prothorax dull from the density of the punctuation; pubescence fusco-cinereous, well developed. Antennæ rather stout, the terminal joint passing the hind angles of the prothorax, second and third joints small, equal in width, the latter only slightly longer; fourth joint much longer and wider than the third. Front broadly concave, the apical margin not distinctly reflexed, surface densely deeply punctate. Prothorax a little longer than wide, slightly narrowed in front, sides very feebly arcuate behind the middle, nearly straight anteriorly; hind angles not carinate; surface densely, moderately, coarsely punctate throughout, median line vaguely impressed posteriorly. Elytral striæ well impressed, interspaces numerously quite strongly punctate. Beneath punctate and pubescent as usual; first joint of hind tarsi equal to the next two; second and third joints without trace of lobes. Length 8–9 mm.

Southern California (Pomona; Mt. Wilson; Santa Monica).

A small dull blackish species, not at all closely allied to any other known to me. In its less strongly projecting non reflexed frontal margin it diverges from the typical *Athous* and approaches rather closely those species of *Corymbites* (e. g. *joculus* and *breweri*), in which, contrary to the prevailing form, the front has a free, acute, though narrow, margin above the labrum. The difficulty of drawing hard and fast lines between the genera *Athous*, *Corymbites* and *Hemicrepidius* (*Asaphes*) is becoming more apparent with the discovery of new forms, and as intimated by LeConte it may become necessary to unite these into a single genus.

Athous agriotoides n. sp.—Moderately slender, head and prothorax piceous, the latter with the marginal bead and hind angles pale; elytra reddish-brown, lower surface in great part piceous, legs and base of antennæ paler; pubescence semi-erect, plentiful, ochreo-cinereous; surface rather feebly shining. Antennæ surpassing by two joints the hind angles of the prothorax, second joint a little less than half the length of the third, the latter slightly shorter than the

fourth and of equal width; outer angle of third joint somewhat acute, that of the fourth and following joints nearly right. Head densely, rather coarsely umbilicate-punctate, front broadly concave, apical margin not reflexed. Prothorax distinctly elongate, sides feebly arcuately convergent anteriorly, scarcely sinuate before the hind angles, which are not or but just visibly divergent, surface densely, rather coarsely umbilicate-punctate throughout, hind angles not carinate. Elytra and lower surface as usual. First joint of hind tarsi a little longer than the next two; third joint with a broad well developed lobe, fourth joint not lobed. Length 9.5 mm.; width 2.5 mm.

Southern California, Santa Monica (Albright).

This species resembles superficially certain species of *Agriotes*. The frontal margin is less produced than in typical *Athous*, but is well defined, and the lobe of the third tarsal joint is unusually well developed; these differences are of degree merely, and the generic reference seems unavoidable.

Athous rufotestaceus n. sp.—*Male.*—Form very slender, not very convex, rufotestaceous, elytra slightly paler; pubescence very fine, sparse and inconspicuous, surface strongly shining. Antennæ slender, the eighth joint attaining the hind angles of the prothorax; second joint nearly one-half as long as the third, the latter equal to the fourth; fourth joint widest, but scarcely more than half as wide as long. Head coarsely closely umbilicate-punctate, front deeply triangularly impressed. Prothorax evidently longer than wide, sides nearly straight and parallel, a little convergent before the front angles, very slightly sinuate before the hind angles, which are a little divergent; disk bi-impressed near the base, surface moderately coarsely punctate, the punctures separated from one-half to their own diameters at the middle, a little closer at sides; hind angles not carinate. Elytra very nearly three times as long as the prothorax, finely striate, striæ rather closely punctate, interspaces more sparsely finely punctate. Beneath more obviously but sparsely pubescent; prosternum closely strongly punctate, metasternum and abdomen more finely punctate; first joint of hind tarsi as long as the next two.

Female.—Stouter and more convex than the male, antennæ shorter and less slender, barely reaching the hind angles of the prothorax, sides of the latter more rounded, elytra a little wider posteriorly.

Length 10.5-12.5 mm.; width 2.5-3.6 mm.; the larger measurements for the female.

Beulah, 3 examples (Cockerell).

Most nearly related to *cribratus*, from which it differs in its less coarsely and densely punctured prothorax, and more slender antennæ of the male. In *cribratus* the fourth antennal joint is three-fourths as wide as long or very nearly so; the color is piceous throughout in the male of fully colored specimens, the elytra paler in the female.

Athous jejunus n. sp.—*Male.*—Slender, piceous-brown, elytra slightly paler, moderately shining, pubescence rather long and plentiful, ochreo-cinereous in color. Antennæ surpassing the hind angles of the thorax by three and one-

half joints; second joint one-half as long as the third, which is barely visibly longer than the fourth; fourth joint a little less than twice as long as wide. Head deeply impressed in front, punctures simple and separated by their own diameters. Prothorax distinctly longer than wide, very little narrowed in front, sides very broadly subangulate at middle, nearly straight and a little convergent anteriorly, broadly feebly sinuate posteriorly, the hind angles short and very feebly divergent; surface finely simply punctate, the punctures distant on the average by about their own diameters; hind angles not distinctly carinate, there is, however, a fine feeble ridge close to and parallel with the outer margin. Elytra finely striate, striæ finely punctured, interspaces sparsely finely punctate, not at all rugose. Beneath finely punctured and pubescent, prosternum more coarsely closely punctured; legs concolorous, first joint of hind tarsi equal to the next two. Length 9.5 mm.; width 2.6 mm.

Cloudcroft (Knaus).

Described from a single male specimen. With this I associate a female from the same locality, which differs from the male type in its broader more convex form, the antennæ not passing the hind angles of the thorax. *Jejunus* is evidently allied to the preceding species and to *simplex*, and also somewhat resembles *affinis*. In *rufotestaceus* the punctuation of the head and prothorax is very obviously coarser and sparser; in *simplex* the third antennal joint is much shorter than the fourth, and in *affinis* slightly shorter than the fourth; the latter species is also of evidently stouter build if the examples so labeled in the LeConte cabinet are authentic.

Aphricus luteipennis n. sp.—Very slender, black or blackish, elytra pale yellowish brown, moderately shining; pubescence pale, fine, short, recumbent. Antennæ about half the length of the body, slender, second joint small, third triangular, fully twice as long and nearly twice as wide as the second; fourth and following joints gradually slightly increasing in length. Head closely shallowly punctate; front broadly concave, margined, the margin strongly rounded. Eyes rather large and prominent. Prothorax elongate, base a little wider than the apex, sides nearly straight, a little rounded in front; no lateral margin; hind angles small, divergent; surface very finely sparsely punctulate. Elytra finely striate, striæ not coarsely punctate, fifth interspace not at all carinate apically; beneath finely punctate and pubescent. Length $5\frac{3}{4}$–7 mm.; width $1\frac{1}{2}$–1 4-5 mm.

Deming. Taken in numbers by Mr. Wickham.

This species differs from *californicus*, the only other known representative of the genus, in color, more slender form, more appressed pubescence, less coarsely punctured head, much less strongly rounded sides of the prothorax, relatively smaller second joint of the antennæ, and less distant middle coxæ. In *californicus* the hind angles of the prothorax are said to have a very fine short carina;

this is scarcely evident in my examples. In *luteipennis* the lateral margin of the hind angles is represented by a very fine, short carina, the true margin taking the form of a short inferior submarginal raised line nearly as in *Cardiophorus*. This inferior line is apparently totally absent in *californicus*. Only males are known to me in this genus, the genitalia being virtually identical in the two species.

Cebrio compositus n. sp.—Dark brown, abdomen somewhat paler, legs and antennæ rufotestaceous. Head rather finely but not densely punctate, the punctures distant by nearly their own diameters as a rule; prothorax sparsely very finely punctate, the punctures separated on the average by three to four times their own diameters; elytra striate as in *bicolor* and *mandibularis*. Mandibles moderately prominent, nearly as in *bicolor;* labrum deeply sinuate, apparently subconnate with the front but with distinct suture. Antennæ slender, feebly serrate; second joint one-half the length of the third, the latter a little more than half as long as the fourth; terminal joint rather abruptly pointed at apex, but not distinctly constricted. Prothorax trapezoidal, wider than long, sides nearly straight, hind angles rather strongly divergent. Prosternal process narrow, nearly as in *mandibularis*. Length 13 mm.

Santa Fé (Fenyes).

This species agrees with *bicolor* in its only moderately prominent mandibles, with *mandibularis* in its narrow prosternal process, and with *estriatus* in its narrow feebly serrate antennæ. The prothorax is more strongly narrowed from the base and more sparsely finely punctured than in any of these species, and the disparity in color between the upper and lower surfaces is less marked than usual.

BUPRESTIDÆ.

Chrysobothris convexa n. sp.—Moderately robust, more strongly convex than usual, both above and beneath; bronzed, moderately shining. Antennæ not narrowed externally, bronzed at base, outer joints piceous, third joint as long as the next two. Front convex, pubescent, with a single well-defined chevron. Clypeus with a very narrow acute cuspiform emargination, margin each side broadly squarely truncate. Eyes more widely separated on the vertex than their own width as seen from above. Prothorax three-fifths wider than long, widest near the front, sides nearly straight and convergent posteriorly, more rapidly convergent to apex, which is a little narrower than the base; surface moderately closely somewhat irregularly punctate, a transverse series of four small, feebly elevated, smooth callosities before the middle; median line not at all impressed, smooth posteriorly, separating two rather broad but distinct basal impressions, which are limited laterally by a short smooth longitudinal elevation. Elytra slightly wider than the prothorax, not quite twice as long as wide, sides parallel in basal three-fifths, apices rounded and serrulate; each with three narrow smooth discal costæ, the first nearly parallel with the suture,

entire; second slightly interrupted at middle and apical two-fifths by the very faint and ill defined impressions; third shorter. Beneath rather strongly cupreo-æneous, pubescent, moderately coarsely closely punctate. Prosternum not lobed in front, ventral segments with small lateral callosities, last ventral not serrulate at sides, the apex squarely truncate. Length 11 mm.; width 4.4 mm.

New Mexico (Alamogordo). A single specimen collected by Viereck.

The type is in the collection of the American Entomological Society. It is evidently a ♀; the front tibiæ are arcuate but without tooth or apical dilation. The non serrate last ventral throws this species into Horn's Group VII, none of the species of which it resembles at all closely; it may precede *sexsignata*. The clypeal margin is unlike in outline that of any species previously described but would be most like *femorata* of those figured by Horn, if the sides of the latter were straight instead of arcuate.

Agrilus townsendi n. sp.—Moderately robust, rather strongly arched in profile, dark bronzed, head and prothorax brassy, pubescence fine, sparse and uniformly distributed, both above and beneath. Antennæ piceous, serrate from the fourth joint, outer joints transverse. Front nearly flat, median line quite deeply impressed posteriorly, punctuation coarse and moderately close, but without trace of strigosity, except close to the thoracic margin, surface polished between the punctures. Prothorax transverse, widest before the middle, sides barely perceptibly sinuate posteriorly, hind angles subrectangular; base strongly sinuate each side, median lobe squarely truncate; disk with a median punctiform impression before the middle, and a larger subbasal one; hind angles with an arcuate carina, which is very obtuse posteriorly, but better defined at its anterior end; sculpture consisting of fine, widely spaced, posteriorly arcuate and subconcentric transverse strigæ, the punctuation fine and not close, surface moderately shining. Scutellum finely feebly carinate. Elytra at base equal in width to the prothorax, sides very faintly sinuate, apices broadly obtusely rounded and finely serrulate; disk with feebly elevated but distinct costa beginning at basal impression and becoming obsolete at apical third; surface finely subimbricate. Prosternal lobe slightly sinuate at middle, intercoxal process suddenly narrowed and acute at tip. Pygidium not carinate. Claws deeply cleft, the inner portion nearly as long as the outer and moderately incurved, their tips nearly equally separated from each other and the outer portion of the claw. Length 7¾ mm.

Rio Ruidoso, White Mts., about 6500 ft., beaten from *Quercus gambellii* (Townsend).

The unique type is a female, and seems to approach most closely *angelicus* of the previously described forms. The claws are toothed in a fashion nearly intermediate between the two types referred to by Horn in his tabular statement, but I think the species is properly placed as here indicated. If it be referred to the larger group with

claws narrowly cleft, the inner portions widely distant, the present species would by Horn's table fall near *politus*, which aside from the form of the claws differs in numerous other details.

LAMPYRIDÆ.

Telephorus insipidus n. sp.—Slender, parallel, dusky testaceous throughout, finely pale pubescent. Antennæ slender, filiform, a little shorter than the entire length of the insect, joints one and three subequal in length, two barely half as long as three, four to eleven longer and nearly equal. Head shining, very finely not closely punctate, front about one-half wider than the vertical diameter of the eye. Prothorax slightly longer than wide, parallel, hind angles obtuse but well defined, front angles wanting; disk feebly channeled along the median line, sides rather deeply broadly impressed anteriorly, tumid each side posteriorly, hind margin narrowly reflexed; surface shining and virtually impunctate. Elytra about one-half wider than the prothorax, finely scabrous, elevated lines very fine and indistinct. Claws simple on all the feet, the base merely a little thickened. Length 9.5 mm.; width 2 mm.

Cloudcroft, Sacramento Mts. (Knaus).

A single male specimen kindly given me by Mr. Knaus. This species differs from *marginellus*, the only previously described species having simple claws, in size, color and relative dimensions of the prothorax. Quite likely there are other differences which the short description of LeConte does not enable me to indicate.

Polemius regularis n. sp.—Black, sides of front beneath the antennal cavities narrowly pale; sides of prothorax broadly pale, the dorsal black stripe entire, of uniform width and slightly narrower than the pale margins. Prothorax transverse, sides parallel and broadly arcuate, hind angles somewhat obtuse and not sharply defined, their vertices a little rounded; front angles wanting. Elytra scabrous, with the raised lines feeble but traceable, more distinct toward the base. Length 8.5 mm.; width 3.5 mm.

Albuquerque (Wickham).

Described from a single female specimen. A second female taken by Knaus at Fresnal Canon is slightly different, but is associated with the type for the present.

Regularis is rather closely allied to two or three of the described species, but on comparison with the LeConte types it looks sufficiently distinct, though it must be confessed that specimens of several of the described species are too few to permit one to judge as to the extent of specific variability. As compared with the present species *princeps* differs in its larger size, pale front, incomplete pronotal vitta and margined elytra; *strenuus* has the pronotal vitta strongly dilated before the base, and *marginicollis* has the prothorax trape-

zoidal in form. *Platyderus* is rather close, but in this the hind angles of the prothorax are somewhat better defined, and the pronotal vitta is always narrow and incomplete, and frequently nearly or quite absent.

Polemius binotatus n. sp.—Head black behind the antennæ, pale in front from side to side, mouth and space between the gular sutures also pale; prothorax rufotestaceous, with two discal black spots; elytra and metasternum black; abdomen, legs and base of antennæ rufotestaceous, tarsi dusky; pubescence grayish, short, but sufficiently plentiful to give the elytra a pruinose appearance. Head finely not closely punctulate, prothorax very minutely sparsely punctulate, elytra feebly subscabrous, somewhat shining, elevated lines obsolete. Prothorax with sides only slightly convergent in front, hind angles a little obtuse and not very sharply defined, front angles wanting. Length 7 mm.

Chiricahua Mts., Arizona (Hubbard and Schwarz).

The type above described is a male, having the sides of the prothorax rather deeply acutely nicked at the middle. The single female at hand differs from the male only in being slightly stouter and in having the abdomen dusky at base; the sides of the prothorax not incised. Differs distinctly in coloration from all previously described species.

MALACHIIDÆ.

Trichochrous sophiæ n. sp.—Moderately elongate, black, scarcely at all æneous, legs bright rufous throughout; antennæ rufous, the outer joints infuscate. Pubescence somewhat sparse, cinereous, subrecumbent, intermixed with numerous longer suberect blackish hairs; marginal fringe of prothorax irregular, consisting of shorter cinereous and very much longer blackish hairs; marginal fringe of the elytra rather long and entirely pale. Head fully three-fourths as wide as the prothorax, sparsely finely punctate, polished; labrum rather strongly transverse, piceous, apical margin narrowly pale; antennæ slender, gradually feebly incrassate, fifth joint obviously longer than wide and scarcely at all wider than the sixth; seventh not dilated, slightly longer than wide; tenth as wide as long; eleventh nearly twice as long as wide. Prothorax one-third wider than long, widest at basal third, sides moderately arcuate and convergent in front, basal angles more narrowly rounded and obtuse. Surface nearly evenly rather strongly punctate, the punctures separated by their own diameters or a little more, interspaces polished throughout. Elytra distinctly wider than the prothorax, parallel, two-thirds longer than wide, punctuation at base similar to that of the prothorax, becoming a little finer and less close toward the apex. Lower surface with rather plentiful cinereous pubescence, abdomen minutely punctate, metasternum scarcely visibly so; prosternal length before the coxæ equal to the thickness of the coxa from front to back. Front and middle tibiæ each with four marginal spines above the apical ones. Length 3.25 mm.

New Mexico; Las Cruces (Cockerell), on *Sophia*.

The type is a female, and has the fifth ventral broadly evenly arcuate at apex. With the type are associated a male from Soledad Canon (Ckll.), and a female from Fresnal Canon (Knaus), both of which are in not very good condition. In both of these the antennæ are distinctly stouter, the outer joints obviously transverse, and it is quite possible that the Fresnal Canon specimen at least represents a distinct species.

In the type there are a few darker hairs along the middle of each elytron, but they are not sufficiently pronounced to give the effect of a discal vitta. The species would seem to fall near *texanus* by Casey's table, the latter species being larger, blacker because of the sparser gray hairs, and more abundant black bristles, and with less slender antennæ.

Trichochrous mixtus n. sp.—Dark brown, legs bright rufous throughout, antennæ pale at base, piceous externally. Integuments shining throughout; pubescence rather dense, consisting of confusedly mingled ochreous and cinereous hairs, which are subdecumbent in great part; the erect hairs short and inconspicuous, except near the lateral margins, and for the most part ochreous in color; pronotal fringe long, bristling and irregular. Head and prothorax finely sparsely punctate, the punctures separated on the average by about twice their own diameters; elytral punctuation a little coarser and closer. Antennæ (♂) much longer than the head and prothorax, very strongly acutely serrate; last joint narrowly fusiform, widest at middle, and about equal in length to the two preceding united. Prothorax very nearly one-third wider than long, narrowed anteriorly, basal angles very obtuse but evident, apical angles not defined. Elytra parallel, twice as long as wide, about one-quarter wider than the prothorax and three-times as long; apex obtusely rounded. Prosternum slightly longer before the coxæ than the thickness of the latter. Abdomen finely punctured and with rather dense appressed pale pubescence. Length 3½–4 mm.

Alamogordo (Viereck).

In the male the fifth ventral is broadly truncate, the inner spur of the middle tibiæ is very broad, and that of the front tibiæ distinctly enlarged, and the erect hairs of the upper surface are more obvious. In the female the antennæ are shorter than in the male, but unusually long for the sex, extending a little beyond the elytral base; the fifth ventral is truncate, with the faintest possible indication of a median angulation, the tibial spurs all slender.

By Casey's table this species might perhaps best be placed before *hirtellus*, though conspicuously differing from that and neighboring species by the feebly developed longer hairs of the upper surface especially in the female.

Trichochrous incultus n. sp.—Oblong, moderately elongate, black; legs piceo-rufous, the tibiæ and tarsi paler; antennæ piceous externally, paler at base; pubescence cinereous, not dense, subrecumbent, interspersed throughout the upper surface with moderately long suberect blackish hairs; pronotal fringe irregular, long and bristling, in great part cinereous; elytral fringe long, cinereous. Head five-sixths as wide as the prothorax, surface polished and sparsely rather coarsely punctate; labrum strongly transverse, more than twice as wide as long, apical margin narrowly pale. Antennæ unusually long and rather stout, passing the elytral humeri; fifth joint evidently wider than the sixth and much larger than the fourth; joints 6–10 gradually slightly longer, the tenth plainly longer than wide, sixth about as wide as long; inner angles acute and bristling with erect hairs. Prothorax a little wider than long, widest at basal two-fifths, sides moderately rounded posteriorly, convergent and nearly straight anteriorly, front angles obtuse, feebly defined; hind angles rounded and indistinct; surface coarsely sparsely punctate. Elytra about one-fifth wider and about two and two-third times as long as the prothorax, sides parallel, apex obtusely rounded, surface coarsely rather closely punctate. Length 2.9 mm.

Mesilla Park, May 7 (Cockerell).

The type is a male and has the fifth ventral truncate and just perceptibly sinuate. The tibial spurs are slender and spiniform throughout. The prosternum before the coxæ is about one-third longer than the coxal thickness.

This species would best be placed after *comatus* in Casey's table. Since writing the above I have seen a series of specimens taken at Alamogordo, New Mexico, by Viereck. In these the legs are of a clearer rufous color, the upper edges of the femora alone being piceous. The female is as usual slightly broader than the male; the antennæ less stout and barely reaching the humeri, the outer angles of the joints with fewer bristling hairs. The long hairs of the pronotal fringe are black, the shorter ones cinereous.

Trichochrous placatus n. sp.—Black, moderately shining, legs red, antennæ rufo-piceous, joints 2–5 paler. Pubescence cinereous, not dense, plentifully interspersed with erect black setæ; pronotal fringe long, irregular and mostly black; elytral fringe long, less irregular, pale in color. Head less than three-fourths as wide as the prothorax, eyes not very prominent; surface polished, finely remotely punctate; labrum not much wider than long, apical margin strongly rounded, piceous in color, apex paler. Antennæ gradually rather strongly incrassate, fifth joint not appreciably wider than the sixth, very slightly transverse; outer joints strongly transverse, tenth nearly twice as wide as long; eleventh about one-half longer than wide. Prothorax very little wider than long, sides broadly arcuate and convergent from base to apex, angles all much rounded; disk finely distantly punctate, the punctures separated by two to three times their own diameters at middle, but a little closer at sides. Elytra one-third wider than the prothorax, two-thirds longer than wide, parallel, punctuation coarser and somewhat closer than on the pronotal disk. Beneath cinereo-pubes-

cent, with longer hairs along the middle of the abdomen. Prosternum before the coxæ one and one-half times the thickness of the coxa; tibial spines rather distant, four or five in each series. Length 3½ mm.; width 1.4 mm.

Organ, New Mexico, 5100 ft., Sept. (Ckll.).

The type is a female, having the fifth ventral strongly, nearly evenly rounded at apex. The elongate prothorax with all the angles broadly rounded is similar to that which Casey declares to be characteristic of the group of species for which he erects the genus *Cradytes;* the ungual appendages are, however, as long as the claws and attached to them throughout. There is no sign of serrulation of the prothoracic margin, though this may exist in the male.

None of the characters given by Casey for the establishment of the genus *Cradytes* are either constant or distinctive and the species must therefore revert to *Trichochorus*. The present species should stand near these and perhaps closest to *rufipennis*.

Trichochrous similis n. sp.—This name is proposed for a form evidently closely related to the preceding and differing as follows: vestiture cinereous on the prothorax, fulvous on the elytra, the erect setæ very numerous and fulvous in color throughout the elytra, except in a scutellar triangle where they are black. Prothorax not more than one-fourth longer than wide, sides parallel and feebly arcuate. Length 4 mm.

New Mexico, La Cueva, Organ Mts. (5300 ft.), on flowers of *Fallugia paradoxa*, Sept. (Townsend). Possibly a variety of *rufipennis*, but the narrower thorax with parallel sides and the abundant fulvous setæ of the elytra are sufficient to easily distinguish it.

Trichochrous bicoloripes n. sp.—Black, with faint æneous lustre, antennæ piceous, femora black, tibiæ and tarsi rufotestaceous; vestiture abundant but not dense, almost entirely cinereous in color, giving the insect a grayish aspect. The vestiture consists of rather long distinctly recurved but not recumbent hairs, with numerous more erect but only slightly longer hairs interspersed throughout; these latter in part blackish at the middle of the pronotal disk, especially anteriorly; fringe of prothorax rather long, fairly even but not dense. Antennæ (♂) fully reaching the elytral base, rather slender, the outer joints just visibly wider than long, terminal joint a little shorter than the two preceding united, oval, pointed. Head polished, feebly wrinkled posteriorly, punctures deep, perforate, not coarse, separated by rather more than their own diameters. Prothorax one-fourth wider than long, very slightly narrowed anteriorly, sides moderately rounded, apical angles a little obtuse and not very well defined, basal angles more obtuse, ill defined; punctuation rather sparse, the punctures coarser than on the head, surface polished throughout. Elytra a little wider than the prothorax and three times as long, rather strongly closely punctate and shining; sutural angles nearly rectangular and sharply defined. Beneath with decumbent cinereous pubescence, punctuation of abdomen fine and sparse but well defined. Length 3.3–4 mm.

Las Vegas Hot Springs (Barber and Schwarz).

The type above described is a male, having the fifth ventral segment broadly subtruncate at apex. In the female the prothorax is a little more narrowed anteriorly, the antennæ shorter, the sutural angles of the elytra more acute, and the fifth ventral broadly angulate at middle. The tibial spurs are slender in both sexes. This species most nearly approaches *comatus*, the latter differing in its entirely black legs, more transverse outer joints of antennæ, longer more bristling vestiture, more numerous erect black hairs, the punctuation of the head and prothorax coarser and closer, and the sutural angle of the elytra evidently rounded.

Trichochrous prosternalis n. sp.—Black, with a feeble greenish lustre; legs rufous, antennæ piceous. Pubescence rather sparse, cinereous, erect setæ numerous, long, black throughout; marginal fringe of both thorax and elytra long and bristling, entirely black. Head rather elongate, sparsely punctate, frontal impression deeper than usual; eyes not prominent. Antennæ strongly incrassate, joints 5–10 increasingly transverse, 11th joint but slightly longer than wide. Prothorax very nearly as long as wide, sides broadly feebly arcuate, slightly sinuate at middle, quite strongly convergent from base to apex; all the angles broadly rounded, side margin distinctly crenulato-serrate throughout; surface finely rather sparsely punctate. Elytra very little wider than the prothorax and twice as long; about one-half longer than wide; punctuation coarse and close. Prosternum very long before the coxæ, being about two and one-half times the coxal diameter; tibial spines slender, rather widely spaced, three or four in number; ungual appendages as long as the claws and attached throughout. Length 4.5 mm.

New Mexico; Mescalero, on *Bigelovia graveolens* (Cockerell).

The type is a male, having the fifth ventral truncate, but the tibial spurs are but slightly modified, being slender and acute on all the feet.

The length of the prosternum is far greater than in any previously described member of the genus and constitutes the most peculiar feature of this very distinct species. It should be placed near *serrulatus* in our lists.

CLERIDÆ.

Clerus corallinus n. sp.

This name is proposed for a form common in New Mexico which has hitherto passed as a variety of *abruptus*, but which I am confident will prove distinct. In any case the appearance is so different from typical *abruptus* that a special name is desirable. The form is as a rule slightly less robust and the punctuation a little finer than

in *abruptus*. The style of coloration is the same, but the median pale fascia is here very broad, occupying the middle third or even more of the elytra, and not interrupted at suture. In *abruptus* the median pale fascia is much narrower, always much more so than the length of the elytra either before or behind it, and always interrupted by the suture, the two portions more or less lunate in form. The head, prothorax and pale elytral areas are of a rather bright coral-red tint, the under surface and legs black, tarsi more or less pale. In typical *abruptus* the thorax is pale, but in by far the greater number of specimens in collections the head and thorax are black.

Specimens in my collection are from Kansas; Boulder, Colorado (Cockerell); and various points in New Mexico (Santa Fé, type; Las Vegas, Organ Mts.; Las Truchas).

SCARABÆIDÆ.

Psammodius ambiguus n. sp.—Oblong, slightly oval, head and prothorax reddish-brown, elytra yellow, suture very narrowly darker; beneath rufotestaceous, legs a little paler. Head coarsely but vaguely and rather irregularly punctate, not evidently verrucose; vertex with faint transverse elevated line which is a little more prominent at middle and extremities; genæ not very prominent, obtuse; clypeus deeply rather narrowly emarginate, sides rounded. Prothorax moderately transverse, sides fimbriate; apex but little narrower than base, sides evenly rounded, hind angles undefined, base broadly rounded, not at all sinuate, basal marginal line well marked. Punctuation uneven in size and distribution, fine and sparse at middle, a little closer laterally with larger punctures intermixed, nearly smooth about the hind angles. Elytra a little wider than and two and two-fifth times as long as the prothorax, about one-third longer than wide, sides nearly parallel, yellowish-testaceous without markings, striæ finely and rather closely punctate, intervals feebly convex, very sparsely and finely punctulate. Under surface finely alutaceous, and sparsely finely punctate; mesosternum not carinate between the middle coxæ. Legs stout, hind femora fully two-thirds as wide as long, all nearly smooth. Front tibiæ smooth, strongly tridentate, spur long, slender and slightly curved; middle and hind tibiæ stout, subtriangular, the posterior stouter, each with two oblique ridges externally; spurs of middle tibiæ very long, not very unequal, the longer nearly equal in length to the first three tarsal joints; spurs of hind tibiæ shorter, scarcely as long as the two basal joints, the upper spur a little longer and distinctly curved. Tarsi rather stout and short, first three joints subtriangular, the basal one as long as the two following; claws slender, about two-thirds as long as the fifth joint. Length 3.3 mm.

El Paso, Texas. A single example collected by the writer. I am by no means certain that this species is really a *Psammodius*, though the small size, fimbriate thorax and rather stout tarsi would so indicate. It departs from all our known species of this genus in

its nonverrucose clypeus and longer tarsal claws, and differs from all except *cælatus* in the two oblique tibial ridges. The terminal spinules of middle and hind tibiæ are even and close set in *ambiguus*, longer and more widely spaced in *cælatus*. If referred to *Aphodius* the present species does not fit well anywhere, but seems closest to *nanus*, in which, however, the front is rugulose, the form narrower, the tibiæ and tarsi normal.

Aphodius moquinus n. sp.—Form moderately convex, nearly parallel (♂), or slightly broader behind (♀); rather pale reddish-brown throughout, the antennæ a little paler; margins fimbriate throughout. Head rather sparsely punctured, frontal line elevated but not distinctly divided into tubercles, a short transverse carina at middle of clypeus, front margin of latter obtusely biangulate each side of the median sinus, the inner angulation more sharply defined; genæ moderately prominent but obtuse. Prothorax (♂) nearly twice as wide as the head, one-half wider than long, slightly narrowed in front; in the female relatively smaller and more obviously narrowed anteriorly; base nearly evenly rounded, barely perceptibly sinuate each side, basal marginal line fine but distinct, hind angles rounded, feebly defined; punctuation not close, somewhat uneven in size, quite regularly disposed. Elytra a little wider than the prothorax, striæ moderate, not very closely punctate; intervals very slightly convex, each with a series of fine punctures each side near the striæ. Beneath sparsely punctate and with sparse yellow hair; mesosternum not carinate. Front tibiæ tridentate, the upper tooth nearer the base than to the apical one, margin above crenulate, face smooth; terminal spur rather slender and feebly arcuate. Short spur of middle tibiæ scarcely more than one-third the length of the long spur (♂), relatively a little longer (♀). Hind femora with a row of setigerous punctures parallel to the posterior margin; first joint of hind tarsus subequal to the next two. Length 5–5½ mm.

Holbrook, Arizona. A single pair sent by Mr. Wickham.

This species must be referred to Horn's Group A, and is closely allied in most respects with *denticulatus*. The latter on comparison is a little larger and more robust, always black, the head relatively wider, the thorax less narrowed in front, and the basal joint of hind tarsus slightly shorter.

Aphodius abusus n. sp.—Robust, strongly convex, parallel, black, shining, legs dark rufous. Head moderately tuberculato-rugose anteriorly, punctate posteriorly; vertical tubercles faint; clypeus sharply angulate each side; genæ very prominent and nearly rectangular. Prothorax nearly equal in width to the elytra, sides parallel, a little rounded in front, surface sparsely finely punctate at middle, rather densely along the sides, especially near the front angles; the punctures laterally fine and coarse intermixed; basal marginal line very fine. Elytra parallel, three-fourths as wide as long, striæ coarse and rather deep, finely not closely nor crenately punctate; intervals flat, very finely sparsely punctulate; seventh interval only about two-thirds as wide at middle as the adjoining ones

and scarcely more than double the strial width. Front tibiæ smooth, lateral margin finely crenulate above; first joint of hind tarsus equal to the two and one-half following. Length 4.2 mm.; width 1.9 mm.

Texas.

Described from a single example sent me years ago as *crassulus*. Further investigation shows that this is the Texan form referred to under *crassulus* in Horn's Synopsis. It is placed with the true *crassulus* in the LeConte collection, but Mr. Blanchard on comparison finds it distinct from the typical form, which is known only from Florida, and is at once separated by its very robust body which is wider behind as in certain species of *Ægialia*.

Aphodius crassuloides n. sp.

This species is closely related to the preceding and to *crassulus*, to which it would be traced by using the Horn tables. From *abusus* it is separable as follows: form slightly less robust, evidently less convex in profile; clypeal angles rather less prominent; genæ much less prominent; there is an ill defined but evident short transverse anterior ridge present in all specimens seen, no trace of which exists in *abusus*. Prothorax punctate throughout nearly as in *ruricola*, the punctures at middle being about as in *abusus*, but at sides plainly less dense than in the latter species. Elytral striæ finer than in *abusus*, the edges of the intervals more obviously crenulate by the punctures, the seventh interval but little narrower than the sixth or eighth at middle. Length 3.8–4.4 mm.; width 1.75–2.1 mm.

Cloudcroft, New Mexico.

Numerous example taken by Mr. Warren Knaus. Sexual differences are slight. Both *abusus* and *crassuloides* bear a general likeness to the common *ruricola* and *granarius*. From the former the angulate clypeus renders separation easy, while *granarius*, aside from the group characters, is at once distinguished by the broad sutural interval of the elytra, this being much narrower than the second in *crassuloides*, the disparity being even more marked in *abusus*.

Aphodius neotomæ n. sp.—Oblong-oval, some examples a little broader behind, others scarcely so. Head and thorax piceous, the latter with the sides sometimes indefinitely paler; elytra dark rufopiceous; beneath piceous, tip of abdomen paler; legs dark rufous, varying to piceous. Head rather feebly tritubercular posteriorly, the tubercles connected by a fine raised line; clypeus punctate and subrugulose, dull in lustre, front margin broadly sinuato-truncate at

middle, sides rounded, genæ obtuse. Prothorax with sides parallel and very broadly arcuate from base to apex; base moderately bisinuate, the marginal line feeble, surface numerously very coarsely punctate with fine punctures intermixed; the coarse punctures more or less evidently umbilicate. Elytra equal in width to the thorax at base; striæ deep and crenately punctate, intervals more or less convex, finely irregularly punctate, moderately shining. Prosternum very strongly, acutely carinate. Mesosternum and sides of metasternum alutaceous, the former coarsely closely punctate anteriorly, the latter moderately punctate at sides, finely and sparsely at middle, not distinctly between the coxæ. Posterior femora sparsely minutely punctate, first joint of hind tarsus subequal to the next three. Front tibiæ tridentate, margin finely crenulate above, front face impunctate. Length 3.1–3.5 mm.

California, Pasadena and Humboldt Co.

The type is one of three examples taken by Dr. Fenyes from the nest of a wood rat (*Neotoma*), April 8th. The Humboldt County specimen was taken by Mr. Barber—also in rat's nest—at Blair's Ranch, Redwood Creek, June 19th. Other examples are in the National Museum collection.

This species must by its characters be referred to Horn's Group B, where it would perhaps best follow *duplex*.

Aphodius rotundiceps n. sp.—Elongate, parallel, black, tibiæ and tarsi dark rufous, antennæ paler. Head subimpunctate, a few minute punctures posteriorly, not in the least tuberculate, the frontal suture completely wanting; clypeus strongly evenly arcuate from side to side; genæ feebly, rounded, not more prominent than the eyes. Prothorax but little longer than wide, a little narrowed in front, parallel in basal half; base finely margined, hind angles feebly obliquely truncate and rounded; punctuation very fine and sparse, a few coarser punctures intermixed, except near the margins. Elytra not distinctly wider than the thorax and a little less than twice as long; striæ fine, finely indistinctly and rather remotely punctate; intervals nearly flat and impunctate. Entire upper surface with minute alutaceous sculpture. Lower surface alutaceous, mesosternum punctured in front, not carinate though a little convex between the coxæ; metasternum sparsely punctate; abdomen with a few scattered punctures basally, the apical segment more numerously punctate. Femora with a few fine punctures; front tibiæ smooth, margin tridentate, feebly crenulate above; terminal spur slender, feebly curved, slightly shorter than the first two tarsal joints; second tarsal joint longer than the first. Shorter spur of middle tibiæ barely half the length of the longer one. Basal joint of hind tarsus nearly equal to the next three; longer spur a little shorter than the basal joint. Terminal spinules of middle and posterior tibiæ short and of nearly equal length. Length 4 mm.; width 1.4 mm.

Highlands, North Carolina. A single specimen, collected by Mr. Frederick Blanchard.

This insect is as narrow as our more slender species of *Ataenius*, and at long range looks not greatly unlike them. By Horn's

arrangement it would come nearest to entering Group F, none of the members of which it at all resembles. The rotundate clypeus is a rare character, possessed by only three other species in our fauna, viz.—*rufipes, depressus* and *rubripennnis*, in all of which, however, the genæ are either moderately or sharply prominent, giving the head an essentially different aspect.

Aphodius umbricollis n. sp.—Form broad, parallel, moderately convex; head and prothorax piceous, with pale outer margins, elytra dull rufotestaceous, under surface and legs reddish-brown. Head finely closely punctate throughout, not evidently tuberculate; clypeus broadly not deeply emarginate, sides rounded; genæ prominent, subrectangular. Prothorax one-half wider than long, scarcely at all narrowed in front, sides broadly rounded, margin explanate; base rather strongly sinuate each side and without marginal line; punctuation fine, moderately close, intermixed laterally with numerous larger punctures. Elytra subequal in width to the prothorax, very finely striate, striæ finely closely punctate; intervals wide, nearly flat, with numerous fine punctures which show no trace of serial arrangement. Beneath alutaceous, mesosternum obtusely carinate between the coxæ; metasternum dull, numerously punctate at sides; abdomen rather sparsely punctate. Femora minutely alutaceous and finely remotely punctate. Anterior tibiæ smooth, terminal spur slender, rather strongly curved. Basal joint of hind tarsus a little longer than the two following. Length 5¾–6 mm.

Described from a small series of specimens taken by the writer along the dry bed of the Rio Grande River at El Paso, Texas, in November, 1889. A single specimen has since been sent me by Mr. Wickham who took it at Albuquerque, New Mexico.

This species should be placed near *explanatus*, the latter differing in its larger size, angulate clypeus, more densely punctate thorax, and more strongly punctured elytral striæ.

Aphodius plutonicus n. sp.—Moderately robust, parallel, convex, black, elytra slightly dull because of minute surface sculpture, tarsi reddish-brown. Head distinctly trituberculate, finely evenly not very closely punctate; clypeus broadly emarginate, sides rounded; genæ obtusely rounded. Prothorax three-fourths as long as wide, sides parallel behind, a little narrowed in front, base faintly sinuate each side of the middle and with fine marginal line; punctuation fine, rather sparse, with intermixed larger punctures, which are more numerous laterally. Elytra equal in width to the prothorax and very nearly twice as long; striæ fine, finely not very closely punctate; intervals finely irregularly biseriately punctate. Beneath alutaceous and dull, the femora very feebly so, the latter sparsely punctate. Mesosternum not carinate; metasternum sparsely punctate at sides; abdomen more numerously punctured. Anterior tibiæ smooth in front, tridendate, margin strongly crenate above. First joint of hind tarsus as long as the two and one-half following; terminal tibial spinules unequal. Length 6 mm.

Described from a single specimen collected by Townsend and bearing label "So. Fork Eagle Creek, White Mts., 8000 ft."

The type is a male, having the spur of anterior tibia slender and rather strongly evenly curved; the shorter spur of the middle tibia with the extreme apex abruptly bent inward. *Plutonicus* resembles quite closely *pectoralis* in the slightly dull elytra, but the latter belongs to a different section by the equal tibial spinules. By Horn's table it would fall near *terminalis*, which is a smaller species, with non-tuberculate head and pale elytral apex.

Aphodius longitarsis n. sp.—Form rather narrow, parallel, not very strongly convex; head and prothorax piceous, front and sides of head and sides of thorax paler; elytra pale yellowish-testaceous, without markings; beneath rufopiceous, legs testaceous. Head moderately convex, frontal tubercles evident, connected by a raised line; surface in front of the raised line coarsely verrucose and with short erect hairs; occiput coarsely punctate, sometimes rugose; clypeus rather deeply emarginate, sides rounded. Prothorax moderately transverse, a little narrowed in front, sides sparsely fimbriate, base evenly arcuate with fine marginal line, hind angles indistinct, sides moderately arcuate; surface with coarse punctures, which are nearly uniform in size but somewhat irregular in distribution, rather sparse at middle, becoming moderately dense at sides. Elytra two-fifths longer than wide, a little wider than the thorax and two and two-third times as long, sides nearly parallel, humeral angles narrowly rounded; striæ moderate, finely punctured, intervals slightly convex, each with a series of fine sparsely placed punctures each side, closely adjacent to the striæ. Mesosternum opaque, not carinate; metasternum and abdomen sparsely punctate. Femora with a few fine punctures. Anterior tibiæ smooth in front, moderately strongly tridentate, spur slender, feebly curved and a little longer than the first tarsal joint. Tarsi very slender and elongate, basal joint of hind tarsus equal to the next two; long spur of both middle and hind tibiæ evidently shorter than the first tarsal joint. Length 3½–4 mm.

El Paso, Texas; Aweme, Manitoba (C. H. Rowe).

The El Paso examples are to be regarded as types. The Manitoba specimens are slightly larger, the thorax a trifle wider, the elytral striæ more strongly punctured. The differences are, I think, of little moment, the wider thorax perhaps indicating the male. The spinules of the middle and hind tibiæ are very unequal, the longer and shorter alternating with considerable regularity. This species seems most closely related to *scabriceps*, with which indeed it has been confused by LeConte, a single specimen being so placed in the collection. The very long tarsi with relatively shorter basal joint will at once enable it to be separated.

Aphodius dialytoides n. sp.—Oblong-oval, piceous, margin of clypeus more or less rufescent, legs dark rufous, antennæ rufotestaceous. Head not distinctly tuberculate, rather closely strongly punctured, somewhat less closely in front; clypeus feebly emarginate, sides broadly rounded; genæ prominent, slightly obtuse. Prothorax one-fifth wider than long, base rather strongly arcuate at middle, slightly sinuate each side, hind angles broadly obliquely truncate, sides nearly straight and just visibly converging anteriorly; punctuation coarse and dense laterally, becoming confluent near the hind angles, sparser and irregular in distribution along the middle; basal marginal line distinct. Elytra as wide at base as the thorax, elongate-oval, one-third longer than wide, widest at middle, humeri dentiform; striæ moderately deep, not closely punctate; intervals three or four times as wide as the striæ on the disk, impunctate, nearly flat, a little convex posteriorly. Mesosternum coarsely densely punctate, with narrow smooth median line in front, becoming somewhat obtusely carinate between the coxæ; metasternum at sides and abdomen more sparsely punctate; femora quite coarsely numerously punctate, the front ones densely so. Anterior tibiæ smooth in front, tridentate externally, the upper tooth slightly in front of the middle, margin not crenate above. Basal joint of hind tarsus as long as or slightly longer than the next three. Length 3.6-3.9 mm.

Male.—Spur of anterior tibiæ moderately stout and abruptly bent or hooked at tip; lower spur of middle tibiæ short, projecting inward almost at right angles to the axis of the tibia.

Female.—Not seen.

Described from two examples taken by Mr. Frederick Blanchard, one at Highlands, N. C., in June, the other at Mt. Watatic in eastern Massachusetts, in September.

This peculiar and interesting little species should evidently be placed near *humeralis*, which exhibits the same peculiarity in the short spur of the middle tibiæ and has the hind angles of the thorax simularly truncate. In this latter respect and in general facies it closely resembles *Dialytes ulkei*, though smaller.

Ochodæus guatho n. sp.—Robust, oblong-oval, fulvotestaceous, with the usual short erect fulvous hair. Head very broad, three-fourths as wide as the prothorax, mandibles very prominent, their outer edge slightly sinuate and subangulate; clypeus squarely truncate, the margin single, with a very small median tubercle; vertex without transverse carina, surface densely granulate-punctates Mentum elevated posteriorly in form of a thin wedge-shaped ligula, which is wider at base than at summit, the latter emarginate. Prothorax not quite twice as wide as long, sides rather strongly rounded, feebly or scarcely narrowed in front, median impressed line fine, only evident posteriorly; surface rather closely granulate. Elytra equal in width to the prothorax and twice as long, very slightly longer than wide; striæ lightly impressed, intervals nearly flat, irregularly biseriately punctate, sutural angle somewhat obtuse. Posterior tibiæ rather slender, gradually wider apically; basal joint of posterior tarsus slender, straight, as long as the two following united. Length 5½-7½ mm.; width 2⅞-3½ mm.

The type is apparently a male and was taken at "Mesilla, July 31, at light" by Prof. Cockerell. With it I associate a smaller specimen from Yuma, Arizona, collected by Dr. Fenyes. No sexual marks are evident. In the structure of the mentum this species is approached by *pectoralis* only, but in the latter the wedge is much thicker at base than in *gnatho*, and its anterior face is concave from side to side, while in the present species the concavity is from top to bottom. In *pectoralis*, moreover, the prosternum is lobed in front, and the basal joint of hind tarsus strongly modified. The mandibles in *gnatho* are even more strongly produced than in *mandibularis*, but are less strongly angulate externally. In the extremely broad head it is approached by no other species at present known.

Ochodæus nimius n. sp.—Form, size and color of *biarmatus*. Mandibles more prominent, their outer margin sinuate and obtusely angulate. Clypeus somewhat thickened but without double margin, an acute tubercle at the middle adjacent to the margin; vertex devoid of transverse ridge. Mentum strongly transverse, scarcely narrowed in front, anterior angles rounded, apex truncate, surface nearly flat throughout. Prothorax a little less than twice as wide as long, moderately closely granulate, impressed line distinct posteriorly. Elytra very slightly more than twice as long as the prothorax, strial punctures rather coarse, intervals nearly flat, irregularly punctate, sutural angle obtuse. Tibiæ and tarsi nearly as in *biarmatus*. Length 5½ mm.; width 2¾ mm.

"Mesilla, July 31, at light" (Cockerell).

By its flat, strongly transverse mentum the present species must be associated with *striatus* and *sparsus*. In *striatus* there is no frontal tubercle, and the vertex is transversely carinate, the color darker and the elytral striæ deeper. In *sparsus* the frontal tubercle is much more posterior in position, being on the vertex instead of adjacent to clypeal margin; the angles of the labrum are more prolonged and the prothorax is shorter.

DICHELONYCHA.

The two following forms are closely related to *backii* and *fulgida* respectively, but differ so constantly in color through long series that distinctive names are desirable, even though they ultimately prove to be merely subspecies.

D. testaceipennis n. sp.—Black, elytra entirely testaceous in both sexes, legs blackish in the male, pale in the female. In an occasional specimen the suture is slightly dusky, and rarely there is discernible a faint greenish surface lustre. Form, structure and sculpture virtually identical with *backii*.

Taken abundantly at Cloudcroft in the Sacramento Mountains of New Mexico by Mr. Knaus, to whom I am indebted for a good series. Mr. Knaus writes thus concerning it: "This species I took on the summit (9200 feet) on scrub oak leaves and balsam pine, also at Wooten's Station, six miles below Cloudcroft at 7000 feet on willow and wild rose, but not nearly so frequent as at the summit of the mountains."

D. mormona n. sp.

This name is suggested for the Utah form alluded to under *fulgida* and *crotchii* in my "Notes on Dichelonycha" (Trans. Am. Ent. Soc., 1901, p. 285). A good series has lately been received from Mr. Knaus, who took them at Stockton, Utah. The females appear to be invariably colored like the males, while in both *fulgida* and *crotchii* the females have the head, thorax, body beneath and legs quite as uniformly testaceous or rufous. The elytral punctuation is intermediate in character between *fulgida* and *crotchii*.

CERAMBYCIDÆ.

Leptura kerniana n. sp.—Form of *propinqua* and allies, black, elytra and abdomen dull rufous, legs rufous, tarsi and tips of the tibiæ blackish; pubescence short, grayish on the prothorax and beneath, blackish on the elytra. Head obsoletely, sparsely, finely punctate, median line impressed; antennæ entirely black, a little more than three-fourths the length of the body (♂), the joints proportioned as in *propinqua*. Prothorax as wide as long, exclusive of the posterior angles, which are strongly acutely produced; sides sinuately convergent from the base to a somewhat tuberculiform prominence in front of the middle, thence straight and rapidly convergent to apex; apical constriction and posterior depression well marked, median line concave; disk rather finely but not closely punctate. Elytra strongly narrowed behind, finely sparsely punctate and immaculate, apices obliquely truncate, the outer angle acute but not spiniform. Length 11 mm.

Described from a single male specimen taken by Mr. F. S. Daggett on the Kern River (elevation 6000 feet), California.

The fifth ventral is broadly but not deeply arcuately emarginate, the limiting angles acute. In *propinqua* the fifth ventral is much more deeply emarginate. The unspotted elytra and coloration easily distinguish the present species from any of those nearly related.

Leptura subcostata n. sp.—Entirely black, pubescence very short, fine, and rather sparse, not longer on the prothorax, blackish throughout; head, thorax and elytra nearly equally, very finely and somewhat sparsely punctate, surface moderately shining. Antennæ (♀) slightly longer than half the body, filiform, not at all stouter externally, fourth joint three-fourths as long as the

third, fifth joint visibly shorter than the third, eleventh not longer than the tenth. Prothorax subconical, the sides convergent and nearly straight, interrupted by a feeble prominence at apical third, basal and apical constrictions very slight at sides, more evident in the form of tolerably well defined impressions at middle, base and apex narrowly sharply margined, hind angles slightly produced. Elytra obviously but not strongly narrowed behind, the apices dehiscent and rather narrowly subsinuately obliquely truncate, the outer angle moderately acute; disk with two fine costæ extending from the base to about the apical sixth, the inner one fairly well marked, the outer one ill defined. Length 18 mm.

Described from a single female specimen taken by the writer at Lake Tahoe. The fifth ventral is truncate with rounded angles. This species should stand in the first division of the genus, but may be distinguished from any known to me by the conical rather than companulate thorax, the hind angles but slightly produced. Add to this the elytral costæ, the very fine punctuation, and the blackish pubescence of the prothorax, which is not larger than that of the elytra, and we have a combination of characters which should make its recognition easy.

Leptura barberi n. sp.—Entirely black, head and prothorax dull from the density of the punctuation, elytra shining. Pubescence fine, fuscous, very short and inconspicuous on the elytra, longer and erect on the prothorax. Head elongated anteriorly, tempora moderate, a little oblique. Antennæ slender, filiform and cylindrical, as long as the body (♂), fourth joint three-fourths as long as the third, the latter subequal to the fifth, eleventh not appendiculate. Prothorax subparallel in basal two-thirds, thence narrowed to the apical constriction; base broadly bisinuate, margined but not constricted or impressed; hind angles small, acute, abruptly produced; surface very densely punctate, a short smooth impunctate line behind the middle. Elytra nearly twice as wide as the basal width of the thorax (exclusive of the angles), strongly narrowed posteriorly, the tips rounded and dehiscent; disk strongly convex at base, the entire surface with not very coarse sharply impressed punctures, which are distant from one to two times their own diameters. Beneath with rather longer grayish pubescence. Length 8–9 mm.

The type is a male collected at Fieldbrook, Humboldt County, California, by Mr. H. S. Barber. With it I have associated examples taken on the Kern River (elevation 6000 feet) by Mr. Daggett, and in western Nevada by Prof. Baker.

The fifth ventral segment is nearly similarly narrowly truncate in both sexes, the female differing from the male only in the shorter antennæ and more robust form.

Barberi should probably enter the first group (Leng's Aa) of the genus, but differs from anything therein by the relatively narrow prothorax, resembling certain *Acmæops* in this respect.

Leptura cockerelli n. sp.—Black throughout, moderately shining, pubescence obscure fusco-cinereous, very short and strongly inclined on the elytra, longer and erect on the prothorax. Head densely but not coarsely punctate, median line finely impressed; tempora short, slightly convergent. Antennæ three-fourths as long as the body (♂), not at all incrassate and not obviously compressed; fourth joint very slightly shorter than the third and subequal to the sixth, fifth slightly longer, eleventh one-third longer than the tenth, the constriction faint. Prothorax not wider than the head, as wide as long, apical constriction moderate, sides parallel at middle or slightly convergent to the basal constriction; hind angles laminiform but short and obtusely rounded, not more prominent than the sides; base impressed before the scutellum, hind margin deeply sinuate each side within the angles; disk densely rather finely punctate and rather shining, a short median impunctate line before the base. Elytra moderately narrowed behind, rather finely and closely punctate, apex feebly narrowly obliquely truncate. Length 9.5–11 mm.

New Mexico, Beulah (Cockerell); Colorado, Ouray (Fenyes).

The described type is a ♂ from Beulah. In this sex the fifth ventral is broadly truncate emarginate, the angles slightly produced. The female differs from the male in its nearly parallel elytra, which in the single specimen at hand are not at all truncate at tip, the slightly wider prothorax and the shorter antennæ, these being about half the length of the body with the outer joints shorter. The fifth ventral in the ♀ is broadly arcuato-truncate. In form *cockerelli* agrees very closely with *crassipes*, near which it should stand in the table.

Leptura insignis n. sp.—Rufotestaceous, elytra somewhat paler; surface moderately shining, pubescence fine, short, inconspicuous; prothorax immaculate or rarely with two faint longitudinal discal spots; elytra each with two elongate marginal blackish spots before the middle, a rather broad brown discal stripe from the humerus nearly to the apex, and a short subbasal inner vitta confluent anteriorly with the discal stripe. Head densely finely punctate, median line impressed, tempora distinctly oblique. Antennæ subequal in length to the body (♂), or three-fifths the length (♀). Prothorax finely closely punctate but somewhat shining, a little longer than wide, sides moderately convergent from base to apex, feebly bisinuated by the apical and basal constrictions, transverse basal depression well marked, median line rather strongly impressed from the middle to the apical constriction, disk feebly impressed each side the middle; hind angles broadly feebly laminate, not produced. Elytra slightly narrowed posteriorly, apices rounded, without trace of sinus or sutural spine. Surface very finely and rather sparsely punctate. Length 20–25 mm.

California, Monterey (Fuchs and Fenyes).

In the male the fifth ventral segment is broadly rather deeply arcuato-emarginate, the angles dentiform and acute; the fifth segment in the female is squarely truncate.

This species is very closely allied to *validus*, but differs constantly in elytral markings and the form of the elytral apices. In *validus* the markings consist of three transverse series of elongate spots, and the apex is transversely sinuate with the sutural angle spiniform.

CHRYSOMELIDÆ.

Luperodes semiflavus n. sp.—Oblong; head, antennæ, prothorax, under surface except the abdomen, and legs, yellow; elytra metallic blue-green, abdomen picescent; upper surface highly polished throughout. Head very slightly narrower than the prothorax at middle, eyes moderately prominent, vertex each side with a longitudinal arcuate row of three punctures, the middle one largest, the others minute; surface otherwise impunctate. Antennæ a little longer than half the body, slender, second joint small, scarcely more than half the length of the third; three, four and five equal or nearly so and more than three times as long as wide, outer joints gradually a little shorter. Prothorax nearly as long as wide, three-fifths as wide as the elytra at base, sides broadly arcuate, front angles narrowly obliquely truncate, hind angles small, dentiform; surface impunctate. Front coxæ distinctly separated by the prosternum; first joint of hind tarsus a little longer than the next two. Length 3 mm.

Dripping Spring, Organ Mts. (Cockerell).

The type is a male, having the basal joint of the front and middle tarsi strongly dilated. Of our previously described species none have the basal joints of the antennæ proportioned as in the present one, though *spretus* and *texanus* approach it in this respect. In both of these the fourth joint is distinctly longer than the third and subequal to the second and third united; they moreover differ much in color, and *texanus* is further distinguished by the contiguous front coxæ. *Bivittatus* and *varicornis* alone agree with *semiflavus* in the color of the head.

Chætocnema costata n. sp.—Moderately broadly oval, piceous, with distinct green-bronze lustre. Antennæ rufotestaceous at base (outer joints wanting), tibiæ and tarsi pale. Head alutaceous, numerously punctate, punctures a little coarser in the clypeal region. Prothorax scarcely one-third wider than long, widest behind the middle, sides arcuate and a little narrowed in front, front angles narrowly obliquely truncate, with slight post-apical angulations; surface not alutaceous, punctuation rather fine, a little coarser near the base and sides, punctures separated by from one to two times their own diameters. Elytra not quite one-fourth longer than wide, basal width subequal to that of the prothorax, sides divergent and nearly straight to basal two-fifths, where they are broadly but distinctly subangulate, thence broadly arcuate and slightly convergent, apex obtusely rounded; surface alutaceous, punctures a little confused in the scutellar region, intervals 3-5-7-9 rather strongly costiform. Beneath closely rather strongly punctate. Length 2-3 mm.; width 1.4 mm.

New Mexico. A single specimen taken at Cloudcroft by Viereck. Type in collection of Amer. Ent. Soc., Philadelphia.

The species differs remarkably from all previously described in the subangulate sides and costiform intervals of the elytra. It may follow *confinis* in Horn's table.

TENEBRIONIDÆ.

Paratenetus crinitus n. sp.

Smaller and slightly stouter than *punctatus*, with which it agrees in a general way, but distinguishable as follows: Erect hairs numerous and conspicuous, punctuation relatively a little coarser, very noticeably coarser and denser on the abdomen; antennal club not darker, prothorax a trifle more transverse, sides a little more rounded; metasternum between the coxæ but slightly longer than the diameter of the middle coxal cavity, subequal to the post coxal length of the first ventral segment and shorter than the second segment. In *punctatus* the erect hairs of the upper surface are shorter and very sparse, being nearly confined to the marginal portions of the thorax and elytra; the intercoxal length of the metasternum is nearly twice the diameter of the middle coxal cavity and much longer than any of the ventral segments. In *crinitus* the metasternum is almost as short as in *fuscus*, which species is, however, very distinct by its subinflated elytra, more rounded sides of the prothorax and absence of erect hairs on the upper surface. As indicated by the very short metasternum the wings are rudimentary in *fuscus* and it is probable that they are so, though perhaps in less degree, in *crinitus*. In all the species of this genus, of which males are known to me, the anterior tibiæ are in this sex strongly acutely toothed at the middle of the postero-interior margin.

A single example from Trout Spring, sent by Prof. Cockerell.

MELANDRYIDÆ.

Carebara brevicollis n. sp.—Elongate, parallel, brown, finely punctate and pubescent. Antennæ less stout than in *longula*, the fifth joint fully, the tenth nearly as long as wide. Prothorax very slightly more than three-fifths as long as wide, width greatest very slightly before the base, where it is visibly greater than that of the base of the elytra; sides feebly rounded and rather strongly convergent anteriorly, all the angles rounded; basal impressions distinct; between them and immediately before the scutellum a still smaller impression. Elytra four and one-sixth times as long as the prothorax, parallel, somewhat depressed, apex obtusely rounded. Length 6 mm.; width 1.75 mm.

Cloudcroft, Sacramento Mts., New Mexico. A single female collected by Mr. Knaus.

In *C. longula*, a rare species of the Middle Atlantic States, the fifth antennal joint is slightly transverse, the following joints increasingly so, the thorax about as long as wide, with the sides nearly parallel, the basal impressions obsolete or very faint.

Carebara californica n. sp.—Intermediate in some respects between *longula* and *brevicollis*. The antennæ are as in *brevicollis*, prothorax less elongate than in *longula*, but more so than in *brevicollis*, being from three-fourths to four-fifths as long as wide, the sides obviously convergent anteriorly, but less strongly so than in *brevicollis;* basal impressions distinct. Elytra much shorter relative to the prothorax than in *brevicollis*, being very nearly three and one-sixth times as long. Length 3.75–5.5 mm.

California, San Bernardino Mts. (5000 feet). Common on pines in midsummer.

MORDELLIDÆ.

Mordella fuscocinerea n. sp.—Rather slender, strongly cuneiform, black, clothed uniformly above with sericeous brownish cinereous hair, the scutellum slightly, the elytral suture not at all, paler. Beneath cinereous pubescent, a piceous spot near the posterior margin of the hind coxal plate, and the ventral segments fuscous posteriorly, especially at the sides. Length 3¼–4¼ mm.

Alamogordo, New Mexico (Viereck).

Nearly allied to *scutellaris*, but narrower and more strongly attenuate posteriorly, and of quite a different aspect because of the much paler pubescence. The antennal and palpal structure is nearly as in *scutellaris*. The sexes differ only very slightly, the eyes being a trifle larger in the male, the antennæ scarcely stouter or more serrate in this sex, the outer joints (8–10) about as long as wide.

Mordella perlineata n. sp.—Elongate, moderately attenuate, disk of elytra somewhat flattened; black, prothorax varied with cinereous nearly as in *marginata*, elytra with the suture and four narrow vittæ on each cinereous, the inner one extending only to the middle or slightly beyond; beneath as in *marginata*. Length 4–4½ mm.

New Mexico (Cloudcroft and Wootens), collected by Cockerell, Knaus and Viereck.

This species is most nearly related to *octopunctata* and *marginata*, but differs markedly from the latter in its more flattened dorsum, the elytra being evidently less strongly arched when viewed in profile. The antennæ are of the same type as in *marginata* but broader, the median joints widest, a little longer and more evidently serrate in the male, in which sex the outer sides (especially) of the joints bris-

tle with short fine erect hairs. Last joint of maxillary palpi broadly triangular, with the inner angle sharply defined in the male, more narrowly triangular with the inner angle more or less rounded in the female. The head is relatively wider than in any other species of the genus now before me except *octopunctata*, being in the male as wide as the elytra at base.

MORDELLISTENA.

Of the fourteen species of this genus recorded in the preceding list I have not personally seen the following from the territory: *aspersa, inornata, impatiens, angusta* and *æmula*. With the possible exception of *impatiens* and *angusta* I have no reason to doubt the correctness of the references. Both *impatiens* and *angusta* possess characters which should make them easily recognizable, and neither could by any possibility, I think, be identical with any of the other species of the present list. The genus might profitably be revised, and when so done, special search should be made for other characters besides the so called tibial and tarsal ridges, which though of very great value, must at times be used with caution. It is certain that the palpi and antennæ offer characters which can be used to advantage.

Mordellistena festiva n. sp.—Form and size of *trifasciata* and *lepidula*. Yellow throughout, the elytra with black markings as follows: An elongate scutellar spot; a small humeral spot connected along the base with the former; a broad median black fascia interrupted at the suture, and a narrower subapical fascia. Hind tibiæ with two strongly oblique, equal, parallel "ridges", extending half way across. Length 2 mm.

Las Vegas Hot Springs (Barber and Schwarz).

Closely allied to *trifasciata* and *lepidula*, in both of which, however, the elytral apex is always black.

Mordellistena pallens n. sp.—Pale yellowish testaceous, abdomen infuscate, except at apex; antennæ with outer joints dusky. Form slender, linear, pubescence pale yellow. Antennæ slender, fourth joint four-fifths as long as the fifth, the latter evidently shorter than the third and fourth united. Terminal joint of maxillary palpi not very strongly dilated, about twice as long as wide, the outer edge shorter than the inner. Hind tibia with two rather short oblique ridges, the upper slightly more oblique, and with trace of a third ridge; first joint of hind tarsi with three ridges, the second with two. Length 3.3 mm.

"Mesilla, July 31, at light" (Cockerell).

Closely allied to *tosta*, the type of which is entirely pale, the fourth joint of antennæ about two-thirds as long as the fifth, the

latter as long as the two preceding united; the tibial ridges longer. Specimens taken by Mr. Schwarz at Deming and identified as *tosta*, are probably the present species, and are so given in the preceding list. Two other forms in my collection are superficially scarcely distinguishable from *pallens*. One of these, from Onaga, Kansas, agrees fairly well with notes taken upon the type of *tosta* and is so labeled. Another form, collected at Tyngsboro, Mass., by Mr. Blanchard, by whom it was labeled *tosta*, seems surely distinct by the following brief characterization:

Mordellistena errans n. sp.—Entirely yellowish testaceous. Terminal joint of maxillary palpi broadly triangular, scarcely one-half longer than wide, the apical edge as long as the inner. Fourth antennal joint longer than the fifth. Hind tibia with two rather short oblique ridges, not reaching the middle of the face of the tibia, and a very small rudimentary third ridge. First and second joints of hind tarsi with two very oblique ridges, the second joint with rudiments of a third ridge. Length 3.6 mm.

The fourth antennal joint longer than the fifth is a very unusual character, which I do not recall seeing elsewhere.

Mordellistena sericans n. sp.—Slender, black, rather densely clothed with grayish silky pubescence; base of antennæ and front and middle legs more or less pale. Terminal joint of maxillary palpi about twice as long as wide; fourth antennal joint slightly shorter and narrower than the fifth. Hind tibiæ with three short moderately oblique ridges, the upper one sometimes smaller, and a rudimentary fourth one present in some specimens. First joint of hind tarsi with four ridges, the upper one at times feeble; second joint with two ridges. Length 3-3½ mm.

New Mexico (Gallup, Highrolls, Elba); California (Pomona).

An apparently common species in the southwest, specimens of which bear the name *unicolor* in some collections. The latter is a stouter species with rather less silky pubescence, abdomen pale at apex, and the third tarsal joint with two ridges.

Mordellistena suspecta n. sp.—Black, linear, pubescence cinereous with sparse fuscous hairs, which on the elytra tend to arrange themselves in longitudinal lines, giving a faint vittate appearance. Last joint of maxillary palpi moderately dilated, the apical edge subequal to the inner. Antennæ piceous throughout, the fourth joint three-fourths as long as the fifth. Hind tibiæ with three short slightly oblique ridges; first joint of hind tarsus with three, second with two not very oblique ridges. Length 2.5-3 mm.

Pecos (Cockerell).

Apparently most nearly related to the eastern *convicta*. The latter is more evidently vittate, with the front legs and base of antennæ pale.

Mordellistena divisa Lec.

A specimen taken at Pecos by Prof. Cockerell seems to fit Le Conte's description, differing from the eastern *marginalis* by its more abundant paler yellowish pubescence as indicated by LeConte. I find also that the antennæ are much stouter than in *marginalis*, the outer joints being but little longer than wide, while in *marginalis*—as represented by examples from Ohio—they are nearly or quite twice as long as wide. If the Pecos specimen is really *divisa*, as seems very probable, the validity of the species is unquestionable.

MELOIDÆ.

Zonitis martini n. sp.—Piceous, thorax red, with a small faint central dark spot; surface feebly shining and with very short, fine, recumbent, pale pubescence. Head less elongate than in *atripennis*, the mandibles less prolonged; epistoma and front of labrum pale; tempora parallel, front and vertex densely not coarsely punctate, occiput more sparsely punctate. Eyes large, distant on the front by barely twice the length of the second antennal joint, beneath by very slightly more than the length of this joint. Antennæ slender, setaceous, more than three-fourths the length of the body, second joint three-fourths the length of the third, joints 3–10 subequal, three times as long as wide or a little less, terminal joint a little longer. Prothorax equal in width to the head, slightly more than three-fourths as long as wide, sides parallel in basal half, rounded and convergent in front, apex but little more than half the width of the base; surface strongly and moderately closely punctate, the punctures somewhat unevenly disposed, but separated as a rule by less than their own diameters; median line finely but distinctly sulcate posteriorly. Elytra densely punctate, the punctures of moderate size and closely crowded. Spurs of hind tibiæ equal, rather slender and acute. Length 8 mm.

Engle, New Mexico. A single specimen collected by Miss Nora Newberry and sent me by Prof. Cockerell. A second specimen collected by Master Martin D. Cockerell at Mesilla Park on mesquite is in the National Museum collection. It gives me pleasure to dedicate the species to its original discoverer. The type is a male, having the fifth ventral segment broadly triangularly emarginate. It is a true *Zonitis*, the maxillary process being undeveloped.

Zonitis vigilans n. sp.—Yellow, elytra brownish, metasternum, tibiæ and tarsi dusky; pubescence pale, short, sparse and moderately inclined. Head of the usual elongate form, the tempora scarcely diverging, surface closely punctate, a small smooth callus between the eyes. Eyes very large, separated on the front by a distance equal to their own vertical diameter, beneath by a distance rather less than the length of the second antennal joint. Antennæ three-fourths the length of the body, slender, setaceous, second joint three-fourths the length of the third, intermediate joints parallel and about four times as long as wide.

Prothorax obviously wider than the head, a little wider than long, sides parallel in basal two-thirds, rounded and strongly convergent apically; surface closely rather strongly punctate, median line faintly briefly impressed posteriorly. Elytra densely punctate, the punctures, however, not so closely crowded as in *martini*. Spurs of hind tibiæ subequal, moderately stout; subacute. Length 9 mm.

The unique type is a male from California, precise locality unknown. It resembles *martini* more closely than any previously described form, but is easily distinguished by the more elongate head, larger eyes, more slender antennæ, color and several other differences evident when the descriptions are compared. Both species would by their large eyes, which extend beneath the head, be associated with *longicornis* and *vittipennis*.

Epicauta ingrata n. sp.—Black, moderately densely cinereo-pubescent; outer joints of antennæ gradually rufescent, tibiæ and tarsi reddish-brown. Antennæ slightly more than half as long as the body, slender, gradually and very slightly attenuate, 2nd joint scarcely more than half the length of the 3rd, 3–11 subequal, filiform, each about four or five times as long as wide. Head and prothorax finely alutaceous but somewhat shining, moderately finely not densely punctate, the latter slightly longer than wide, parallel, narrowed in front, median line impressed as usual. Elytra finely scabrous and dull, finely punctate, the pubescence condensed in a narrow sutural line and along the outer margin. Front tibiæ of male with a single spur; basal joint of front tarsi concave beneath. In the female there are as usual two tibial spurs, and the front tarsi are unmodified. Length 7–10 mm.

Taken at Clouderoft and Wootens by Mr. Knaus.

With the typical form I have placed a series collected at Pecos by Prof. Cockerell, and others from Williams, Arizona, taken by myself, these differing only in the tibiæ and tarsi being scarcely at all rufescent, and the sutural line of denser pubescence very faintly indicated.

This species is evidently a near ally of *pedalis* from Lower California, which is said to be sparsely pubescent, with rufous legs, the knees, front tibiæ and tarsi darker.

Epicauta ruidosana n. sp.—Black, rather sparsely clothed above with short black pubescence, which is intermixed with white on the head; entire basal margin of the prothorax with a compact fringe of short erect white hair; a thin median vitta of the same color; elytra with a narrow dense sutural and marginal line of white hair except at base; pubescence of under surface white, that of the legs mixed, the hairs of the femora mainly white, and of the tibiæ and tarsi largely black. Antennæ slightly longer than half the body, slender, filiform, not distinctly attenuate or compressed; second joint about one-third the length of the third, the latter one-half longer than the fourth; following joints scarcely visibly decreasing in length, and each about three times as long as wide.

Head quadrate, feebly shining, rather coarsely and closely punctate, median line impressed, more deeply so behind. Prothorax subquadrate, sides parallel, punctuation equally close and nearly as coarse as that of the head. Elytra dull, finely punctate. Front tibiæ with two spurs in both sexes. Length 10–13 mm.

Three examples are before me, all collected by Townsend on the North Fork of the Ruidoso, White Mountains, 7200 feet.

By Horn's table this species would stand with *caviceps* because of its antennal structure.

RHIPIPHORIDÆ.

Myodites viereckl n. sp.—*Female.*—Black, prothorax with sides and middle of base yellow, or almost entirely black, with but slight trace of yellow at sides; elytra yellow; abdomen yellow, first four or five dorsal segments each with a large transverse black spot, the whole forming a broad stripe; terminal dorsal with small subapical spot and the side margins near the apex black; ventral segments marked transversely with black in varying degree; legs entirely yellow. Head closely but not very coarsely punctate, vertex obtuse. Antennal rami unusually long, notably decreasing in length from base to apex. Prothorax finely, moderately closely punctate basally, broadly smooth at sides and in front; elytra indistinctly punctate, abdomen very finely so. First joint of hind tarsus about twice as long as wide, much wider than the following joint and twice as long. Length 8–11 mm.

Alamogorda (Viereck); Florence, Arizona (Skinner).

Of this species females only have been seen. By Le Conte's table (Trans. Am. Ent. Soc., 1880, p. 210) *popenoi, semiflavus* and *scaber* are said to have the abdomen in the female yellow, while in all the remaining species it is black in both sexes. In this respect the present species occupies an intermediate position, the prevailing color being yellow, but with about as much black as yellow in some specimens. From *popenoi, viereckl* may be further separated by the much less stout basal joint of the hind tarsus, while the smooth thorax and less densely punctured head will separate it from *scaber*. I have compared with type of *semiflavus* (described from Maryland) and found them quite distinct, but neglected to make note of differences.

Solidaginis Pierce agrees well in size, in tarsal formation and general aspect, but differs by the black legs and uniformly punctured thorax. In both *solidaginis* and *scaber* the antennal pectinations are of nearly uniform length from base to apex, and very much shorter than in *viereckl*, in which the basal ramus is fully twice as long as the apical and about three-fourths as long as the width of the front between the eyes. This character will I believe separate the present species from many, and perhaps all of our previously described forms.

OTIORHYNCHIDÆ.

Ophryastes symmetricus n. sp.—Elongate-oval, strongly convex, densely clothed with cinereous, ochreous and dark brown scales and with abundant erect short brownish pointed setæ. Beak evidently longer than wide, moderately dilated at apex, separated from the front by an evident though not strong transverse impression; upper surface trisulcate, median sulcus broader and with a central carina; lateral sulci shorter, broader behind and not very well limited externally. Antennæ cinereous, club piceous; first six funicular joints longer than wide, the outer ones only slightly so, seventh joint as wide as long, basal joint shorter than the next two together; front moderately convex, with an elongate median fovea. Prothorax five-eighths wider than long, widest just before the middle, sides moderately nearly evenly arcuate, not tuberculate; apical constriction feeble, basal constriction wanting; surface broadly uniformly convex, deeply, rather coarsely, unevenly punctate. Elytra oval, nearly two-fifths wider than the thorax and one-half longer than wide, sides broadly evenly arcuate, base truncate, the angles nearly right, but small and only very slightly prominent; striæ fine, the punctures scarcely detectable; interspaces nearly flat, but alternately a little more convex. Beneath densely scaly as above, the scales in great part cinereous, but minged with ochreous at the base of the abdomen and on the sternal side pieces; setæ paler, finer and more inclined than above. Legs slender, tarsi narrow, all the joints elongate, the basal joint of hind tarsi more than twice as long as wide and shorter than the next two combined; third joint emarginate rather deeply but not at all wider than the second; first three joints beneath concave, glabrous at middle, densely pilose at sides; terminal joint scaly and setose. Length 10.5 mm.; width 4 mm.

Santa Fé (Fenyes), one example. The maculation of this species is more distinct and symmetrical than usual in this genus, and is as follows: head with a median vertical vitta of dark brown; a wider stripe of the same color through the eye, continued in a sharply defined prothoracic vitta; middle third of the prothorax cinereous, sides beyond the brown vitta cinereous, flanks with an ochreous stripe. Interspaces 1–3–5, etc., ochreous; 2–4–6, etc., cinereous, each with a double row of elongate dark brown spots. The tarsal structure of this species is so different from that of any of our other *Ophryastes* as to perhaps exclude it from this genus; as remarked by Horn, however, there is some variation in this respect among our older species. Other characters separating *symmetricus* from previously described species are: the median rostral carina, more abundant and more erect setæ, lack of lateral thoracic tuberosities and slightly arcuate first ventral suture.

The establishment of *Eupagoderes* by Horn for certain species previously referred to *Ophryastes* has not proved satisfactory, all the characters named being gradational. The most conspicuous of these, taking the species as a whole, is the presence of lateral callosi-

ties of the prothorax in *Ophryastes*, but as pointed out by Dr. Sharp in the "Biologia" this cannot be properly regarded as a generic character. The latter author is, however, equally at fault in stating that the two genera may be separated by the presence (*Eupagoderes*) or the absence (*Ophryastes*) of adhesive pubescence on the lobes of the third tarsal joints, this character being a purely sexual one in at least a considerable number of species of both genera and possibly in all.

Anametis subfusca n. sp.—Closely related to *grisea*, from which it differs as follows: the scaly covering is a darker brownish-gray, the elytral setæ more numerous and still less evidently serial in arrangement; prothorax finely subgranulate, the granules closely placed, flattened, each bearing from four to six of the closely adherent scales. The surface in *grisea* is nearly smooth, not evidently granulato-reticulate. Length 6–7 mm.

The type is a ♂ from Cloudcroft, collected by Mr. Knaus.

The form is subparallel, the elytra but slightly wider than the thorax; the last dorsal segment truncate and emarginate, the last ventral subtruncate at apex and with a broad deep concavity extending throughout its length; third funicular joint about three-fourths as long as the second. With the male type I have associated two female specimens taken by Prof. Cockerell at Beulah and Pecos, which differ in their wider more oval elytra, being in fact closely similar in form to *grisea*. In these the terminal dorsal and ventral segments are rather narrowly rounded at apex, the latter with a much smaller apical impression; the third funicular joint but little more than half the length of the second. The present species bears a very deceptive resemblance to *Thricomigus luteus*, which differs, however, in its arcuate first ventral suture and in the stouter antennal funicle and club.

Cimbocera conspersa n. sp.—Rather more than two and one-half times as long as wide; black, densely clothed with small rounded scales and numerous rather fine pointed erect pale hairs, which vary in length from one to two times the width of the sutural interspace; scales cinereous, mottled with darker gray or brownish-gray, the pale color usually predominating. Head evenly convex; eyes oval, feebly convex; beak stout, slightly longer than wide, a little dilated at apex, distinctly separated from the front by a transverse impression; upper surface nearly flat, neither sulcate nor carinate. Antennæ rather stout, 1st joint of funicle about equal in length to the next two, 2nd subequal to the two following; 3–7 transverse, gradually slightly wider; 7th about as distinct from the club as usual. Prothorax four-fifths as long as wide, sides moderately evenly arcuate, basal and apical constrictions feeble, base and apex

squarely truncate, equal in width; pronotal scales in great part dark in color with a narrow median pale vitta, which is sometimes not well defined. Elytra oval, one-third wider than the prothorax and two and two-third times as long; scales confusedly mottled, erect hairs forming a fairly regular series on each interspace; striæ finely impressed, distinctly closely punctate, interspaces flat or slightly convex. Beneath scaly and hairy as above, the hairs more inclined; front tibiæ mucronate at tip and with a few small denticles along the inner margins; middle tibiæ more feebly mucronate, hind tibiæ not appreciably mucronate, third tarsal joint not wider than the second, moderately emarginate as viewed from above. Length 6–7 mm.

Described from a fairly good series taken by Dr. Fenyes and Prof. Cockerell at Santa Fé and San Ildefonso respectively. Other specimens apparently identical in every way are in my collection from "Arizona."

The reference to *Cimbocera* is provisional, though aside from the distinct separation of the seventh funicular joint from the club, and the evidently mucronate middle tibiæ, the characters seem to agree well with Horn's diagnosis. The second ventral segment is said to be equal to the next two in length in *C. pauper*, but is considerably longer than the next two in *conspersa*.

Pandeletejus rotundicollis n. sp.—Similar in size and general aspect to *hilaris*. Clothed throughout with a dense crust of dark brown and cinereous scales, the dark scales condensed in a somewhat imperfect subfusiform dorsal pronotal vitta, the two colors broadly confused on the elytral disk; the apex, in great part, and an irregular lateral spot on each cinereous; entire surface with very short recumbent extremely inconspicuous setæ, which are arranged in single series on the elytral interspaces and are more evident beneath. Head and beak in front of the eyes longer than wide, sides moderately convergent apically, upper surface concave, apex triangularly emarginate and with a very small triangular smooth area. Antennæ pale, funicle six-jointed, first joint stouter and about as long as the next two, second subequal in length to but not wider than the next two, outer joints submoniliform and gradually slightly wider. Prothorax nearly as long as wide, sides strongly roundly dilated, basal and apical constrictions equal. Elytra widest at apical two-fifths, where they are a little less than twice the thoracic width; striæ fine, interspaces nearly flat. Anterior tibiæ nearly straight, suddenly a little bent at the extreme tip, the inner margin with about eight denticles. Length 4.5–5.5 mm.

Described from two examples taken by Mr. Knaus at Cloudcroft in June.

Distinguishable at once from all our other species by the 6-jointed funicle, which does not, however, necessitate generic separation, all other characters being those of *Pandeletejus*. The thorax is more strongly rounded at sides than in any of our other species and the rostrum is rather longer.

Pandeletejus simplarius n. sp.—A little stouter than *hilaris*, and like it densely clothed with brown and cinereous scales, confusedly mottled on the elytra, the prothorax with a central fusiform vitta and some lateral spots dark; recumbent setæ excessively short, sparse and inconspicuous. Beak before the eyes (exclusive of the mandibles) wider than long, narrowed anteriorly, upper surface flat and finely sulcate. Antennal funicle 7-jointed, 1st joint not much shorter than the three following, the outer joints subequal, short, evidently longer than wide, and not increasing in width. Prothorax as long as wide, sides moderately strongly arcuate, apical constriction less marked than usual, the basal constriction especially short and feeble. Elytra slightly more than twice as long and barely one-half wider than the prothorax, widest behind the middle, striæ fine; intervals broad and flat. Legs rufotestaceous, front tibiæ a little bent at apex and with about seven denticles on the inner margin. Length 5 mm.

The type, and only specimen seen by me, was taken at Cloudcroft by Mr. Knaus. The large prothorax with feeble basal and apical constrictions, short robust beak and longer first funicular joint, are the principal distinguishing characters of this species.

Pandeletejus subtropicus n. sp.—Moderately elongate, densely clothed with dark brown and pale brown or grayish-brown scales, the recurved setæ stouter than usual but very sparse and inconspicuous. Beak subquadrate, barely as long before the eyes as its width, median line finely sulcate. Antennæ pale, funicle 7-jointed, 1st joint a little longer than the next two, outer joints very slightly increasing in width, the seventh as wide as long. Prothorax longer than wide, narrow, cylindrical, dilated a little in about its middle half, scales pale brown in a broad dorsal vitta, sides dark brown. Elytra twice as wide as the prothorax, humeri nearly rectangular and narrowly rounded, sides very slightly divergent posteriorly in the male, more distinctly so in the female; disk broadly variegated with dark and pale brown, the former predominating, this darker area entered by an oblique median pale fascia which does not reach the suture; sides and apex paler; interspaces alternately more convex, becoming quite prominently so at the summit of the apical declivity. Legs and lower surface as usual. Length 2.3–4 mm.

Florida (Key Largo).

Several examples collected by Mr. Beyer.

This species agrees with *cinereus* in its small size and narrow subcylindrical thorax, but differs from it and all our other species in its alternately costiform elytral intervals, in the prevailing brown color of the scales, and in the paler central dorsal vitta of the pronotum, this being darker than the lateral region in all others.

Our five species may be tabulated as follows:

Antennal funicle 6-jointed ..... **rotundicollis.**
Antennal funicle 7-jointed.

Prothorax much more than half as wide as the elytra, the sides strongly rounded, size larger, averaging 4.5 or 5 mm.

Prothoracic constrictions (especially the basal one) feeble, first funicular joint very distinctly longer than the next two.....**simplarius.**

Prothoracic constrictions strong, first funicular joint not longer than the next two ... .**hilaris.**

Prothorax not or but little more than half as wide as the elytra, form more cylindrical, size smaller, averaging about 3 mm.

Alternate elytral interspaces not elevated, median dorsal pronotal vitta dark; prevailing color of scales gray.....**cinereus.**

Alternate elytral interspaces elevated, median vitta of pronotum pale, prevailing color of scales brown .....**subtropicus.**

Cyphomimus ochrens n. sp.—Rufotestaceous, form and size almost precisely as in *C. dorsalis*. Upper surface clothed throughout with small rounded ochreous scales having a faint greenish lustre; prothorax obscurely vittate; erect hairs short, of same color as the scales, arranged in single series on each elytral interval. The scales of the upper surface are nearly or quite in mutual contact throughout, but do not at all overlap; beneath they are sparser and intermixed with hairs, the ventral surface and legs sparsely hairy, without scales. The alæ of the beak are scarcely at all divergent (evidently so in *dorsalis*), and the legs are slightly less stout than in *dorsalis*, and have the anterior tibiæ finely denticulate within. Length 3.6 mm.

Cloudcroft; collected by Mr. Knaus.

CURCULIONIDÆ.

Trichalophus arcuatus n. sp.—This species possesses the general facies and characteristic sculpture and vestiture of the genus, the features of comparative value being the following: beak broadly rather feebly channeled above, the lateral grooves narrower and distinct, but not deep. Prothorax fully one-fourth wider than long, widest at the middle, the sides strongly evenly arcuate; anterior transverse impression obsolete, median line smooth for a short distance at middle, but neither carinate or impressed. Elytral striæ quite distinct throughout. Vestiture of upper surface evenly but somewhat obscurely mottled, that of the underside entirely hair-like. Length 12 mm. (including the beak); width 5 mm.

Beulah. One example sent by Prof. Cockerell, who found it "eating a leaf of *Rubus deliciosus*" in August. A second example in Mr. Wickham's collection is labeled "Cloudcroft B. S. viii."

This species would fall near *seriatus* in Le Conte's table, but differs from that in its strongly evenly arcuate sides of the prothorax and lack of squamiform pubescence at the sides of the body beneath. The median rostral groove is also much narrower and deeper in *seriatus*.

Phyllotrox quadricollis n. sp.—Ferruginous, rather sparsely clothed with recumbent golden-yellow pubescence; metasternum, tarsi and antennal club blackish. Head coarsely densely punctate; eyes rounded, distant from the prothorax; beak about three-fourths the length of the prothorax, just visibly wider at apex, feebly arcuate, coarsely closely punctate and substriate. Antennæ inserted at apical third, scape directed against and barely attaining the eye; funicle short, stout, outer joints wider and very strongly transverse, merging into the club. Prothorax subquadrate, sides broadly arcuate and very slightly convergent nearly to apex, then suddenly narrowed to the feeble apical constriction; surface coarsely closely punctate. Elytra twice as long as the prothorax, and barely one-fourth wider; about two-thirds longer than wide; striæ scarcely impressed, closely punctate, the punctures tending to become irregular toward the base; intervals with a single or irregular double series of finer punctures. Metasternum densely rather finely punctate, the preceding segments more finely and sparsely so. Legs as in *P. nubifer* but stouter. Length 2.4–2.8 mm.

Beulah. Two examples on *Carduus parryi* (Cockerell).

There is very little sexual difference in the length of the beak, but the male has the fifth ventral emarginate and somewhat shorter than in the female, the pygidium produced, convex at apex and plainly exposed. This species resembles the paler forms of *nubifer* in a general way, but is a little larger, with broader thorax, the elytral humeri consequently less widely exposed, the legs thicker, the beak shorter; the pygidial groove does not attain the apex as it does in *nubifer*.

HYPOLESCHUS new genus.

Beak a little longer than the head and prothorax, rather slender, cylindrical, evenly arcuate. Antennæ inserted beyond the middle, scape not quite reaching the eyes; funicle 7-jointed, first two joints longer, outer joints strongly transverse; scrobes moderately deep, directed against the lower portion of the eyes, which are broadly rotundate oval and not very convex. Prothorax cylindrical, narrowed and slightly constricted at apex. Elytra much wider than the prothorax, finely striate, striæ closely punctate. Prosternum before the coxæ rather longer than the diameters of the coxal cavities; coxæ contiguous; middle coxæ separated by half their own diameters; metasternum longer than the first ventral segment. Ventral segments one, two and five long, third and fourth together equal to the second but scarcely as long as the fifth; first suture a little arcuate at middle. Legs rather slender, tibiæ straight, not at all mucronate or unguiculate. Tarsi not very stout, pilose beneath, third joint wider and deeply bilobed; claws appendiculate.

This genus is related to *Elleschus*, but differs in the longer and more slender legs and beak, unarmed tibiæ and finer and sparser

vestiture. Like *Elleschus* the second ventral suture is evidently bent backward close to the lateral margin, and nearly as much so as in *Proctorus decipiens*, which because of this character is placed in the Tychiini. It will be seen from this that it is impossible to sharply separate the Anthronomini and Tychiini by this means.

The genera *Elleschus*, *Hypoleschus* and *Proctorus* forming in this respect a perfect transition from one tribe to the other.

Hypoleschus atratus n. sp.—Black, tarsi and antennæ paler, moderately shining, sparsely clothed with fine cinereous appressed pubescence. Beak rather slender, cylindrical, slightly longer than the head and prothorax, closely finely punctate, the punctures more or less linear in form, especially above, antennæ inserted two-fifths from the apex, scape rufous, funicle and club becoming gradually piceous; first and second funicular joints elongate, first stouter and slightly longer than the second, the latter as long as the third and fourth together; 3–7 transverse, increasing in width, the seventh fully twice as wide as long, club broadly oval, pointed, as long as the four preceding joints. Prothorax nearly as long as wide, sides straight and parallel in basal three-fourths, then rounding in to the rather feeble apical constriction; disk evenly convex, and closely not very finely punctate. Elytra fully one-half wider than the prothorax, base truncate and broadly feebly emarginate, sides parallel and very feebly arcuate for two-thirds their length, thence narrowed and conjointly rounded; striæ lightly impressed, closely punctate; interspaces nearly flat and much wider than the striæ, finely sparsely punctulate. Beneath finely punctate and sparsely pubescent. Length 2.25 mm.; width 1 mm.

Beulah (Cockerell and Skinner); four examples.

In each of the four specimens the abdomen is broadly concave at base, perhaps indicating that all are males. The pygidium is deeply longitudinally grooved in the same manner as in *Phyllotrox*, also a male character.

Otidocephalus rhois n. sp.—A little stouter than *myrmex*, the form very nearly as in *diehrous;* black, polished, abundantly clothed with fine erect black hairs, intermingled with suberect, more or less recurved, white hairs, which are more numerous toward the sides and apex of the elytra. Beak with coarsely punctured superior and lateral grooves, the median line smooth, becoming wider and with a few fine punctures near the apex; front and head coarsely densely punctured, without well defined interocular impressions. Eyes separated by fully three-fourths their own width. Antennæ blackish, second funicular joint a little longer than the third and quite three-fourths as long as the first; club less than twice as long as wide. Prothorax elongate oval, base slightly narrower than the apex, sides moderately arcuate, a feeble sinuation before the apex; surface coarsely densely punctate, a narrow incomplete smooth median line. Elytra less than twice as wide as the prothorax and not quite twice as long as wide, wider behind, striæ not or but feebly impressed, the punctures close set but not large, interspaces wide, flat or nearly so with numerous confused setiferous punctures. Under surface with plentiful short fine erect whitish hairs, the

sternal paraplenræ densely plumose squamose. Legs moderate, femoral teeth very small, acute. Length 5 mm.; width 1.8 mm.

Described from a single example taken by Townsend in the White Mts. (Rio Ruidoso, 6500 feet) on *Rhus glabra*.

Of the described species this is obviously most nearly related to *scrobicollis* Boh., of which Horn says the elytral intervals are a little convex and bear each a single row of setiferous punctures, while Casey states that the second funicular joint is barely half the length of the first.

Epimechus nanulus n. sp.—Black, shining, tarsi and base of antennæ brownish; upper surface not very densely clothed with rather large white appressed scales. Beak slender, evenly arcuate, longer than the head and thorax (♀), finely not densely punctate, not striate, squamose at base. Head sparsely punctate, without well defined frontal impressions, eyes rather flat, posterior margin not free, separated on the front by a distance which is plainly less than the width of the beak. Antennæ inserted near the middle of the beak, funicle 7-jointed, first joint a little shorter than the three following united, second slightly longer than the third, outer joints slightly wider, evidently transverse. Prothorax wider than long, sides moderately arcuate, apical constrictions evident, base a little wider than the apex, feebly bisinuate, surface rather coarsely deeply closely punctate, the interspaces polished. Elytra about one-fourth wider than the prothorax, sides nearly straight for three-fourths their length; striæ slightly impressed, the punctures rather coarse and closely placed; intervals a little wider than the striæ and feebly convex. Prothorax beneath punctured and squamose; metasternum and abdomen minutely remotely punctate and sparsely pubescent; legs scaly, thighs not distinctly toothed; hind tibiæ nearly straight. Length 1.5 mm.

Albuquerque. A single ♀ specimen from an unrecorded source.

The fifth ventral is only slightly longer than the fourth; pygidium entirely concealed. This species is much the smallest of the genus; it would seem to be nearest *curvipes* by Dietz's table, but the latter species is said to have the hind tibiæ strongly curved in both sexes.

Epimechus stragulus n. sp.—Black, plentifully though not very densely clothed with recumbent white scales, which are narrow or even sublinear in form; beak substriate laterally toward the base; antennal funicle 6-jointed; front thighs with a minute acute tooth, middle and hind thighs not toothed; in other respects (except size) very nearly as in *nanulus*. Length 2 mm.

Wootens. A single specimen, probably a female, collected by Mr. Knaus. Should follow *adspersus* in Dietz's table.

In *adspersus* the scales of the upper surface are shorter and wider than in the present species and are intermixed with numerous short, stout hairs; the under side is more scaly also, and there is a sharply defined linear frontal impression which is lacking in *stragulus*.

Conotrachelus invadens n. s.—Robust, rufopiceous, clothed not very densely with small narrow ochreous and broader white scales, each elytral interval with a row of short erect setæ. Beak slightly less than half the length of the body, not striate, rather finely punctate. Antennæ inserted at the middle of the beak, first funicular joint subequal to the next two, second slightly shorter than the third and fourth united, the third scarcely as long as the fourth. Front with a small moderately deep fovea. Prothorax wider than long, subconical, apical constriction evident but not strong; surface moderately densely not very coarsely punctate, not at all carinate, vestiture ochreous at middle, white laterally. Elytra four-sevenths wider than the prothorax and three times as long, sides parallel; humeral angles right, abruptly rounded; interspaces convex, the alternate ones finely evenly carinate. Body beneath coarsely closely punctate, vestiture sparse, consisting of very narrow whitish scale-like hairs on the abdomen, and of broader white scales on the sterna. Mesosternum protuberant in front. Thighs scarcely annulated, the front and middle feebly toothed, the hind ones more strongly and acutely so. Length 5 mm.; width 2.75 mm.

Described from a single specimen taken by Mr. Knaus at El Paso, Texas. It should be placed next to *adspersus* to which it is quite similar in appearance; the latter, however, lacks the erect bristles of the elytra, and the funicular joints are differently proportioned, the third joint being much longer than the fourth; the white scales are also more obviously condensed in spots than in the present species, in which they show a tendency to become aggregated in longitudinal vittæ which alternate feebly with the ochreous scales.

Acalles indigens n. sp.—Blackish-brown, clothed with dull yellowish and brown scales, which are rather sparse, linear, and appressed on the prothorax; stouter, though about three times as long as wide, on the elytra, where they are closely but not very densely placed; in great part recumbent, but tending to become reclinate toward the sides and apex, especially on the more prominent interspaces. Head and basal portion of the beak densely scaly, scales yellowish on the occiput, dark brown on the front and beak; beak stout, densely punctate, feebly carinate basally. Eyes small, flat, entirely lateral. Antennæ pale rufous, first joint of funicle subequal in length to the next two together, second joint about as long as the third and fourth united; seventh as wide as long, club ovate, widest a little beyond the middle. Prothorax nearly as long as wide, broadly constricted in front, moderately rounded just before the middle, thence convergent and nearly straight to base; surface densely evenly punctate, median line not at all carinate or sulcate. Elytra rather broadly ovate, one-third wider than the prothorax, and slightly less than twice as long; humeri not defined; strial punctures rather coarse, close set, the interspaces narrower than the punctures, more or less convex. Scales obscurely mottled without well defined spots or bands, a small pale spot on the third interspace at the summit of the declivity being most noticeable. Beneath very coarsely deeply punctate with sparse linear scales. Legs dark brown, feebly annulate with pale scales. Length 3.4 mm.; width 1.7 mm.

Cloudcroft. A single example sent by Mr. Wickham, who retains the type. This species may best precede *clavatus* in our list.

A brief examination shows that our species of *Acalles* are divisible into two sections, in one of which the eyes are widely separated and entirely lateral, while in the other they encroach upon the front, their distance apart being less than the width of the beak. More or less completely correlated with this difference in ocular structure, is the development of the erect bristles; these being entirely or virtually absent in the species with more approximate eyes, and nearly as constantly present in those species having the eyes smaller and widely separated. *Hubbardi* is a notable exception in the latter group.

Centorhynchus notatulus n. sp.—Oval, piceous; knees, tibiæ and tarsi dull rufous; clothed rather thinly above with short appressed or subappressed brownish scale-like hairs with sparsely scattered whitish scales, the latter condensed in the median prothoracic channel and in a large subquadrate scutellar spot. Beak moderately punctate and striate basally, more sparsely punctate apically. Antennæ (♀) inserted just behind the middle of the beak, funicle 7-jointed, first two joints subequal and elongate. Head densely punctate and rather strongly carinate, front feebly concave. Prothorax transverse, sides rather strongly rounded posteriorly and very slightly convergent; strongly narrowed and constricted apically, the apical margin elevated; dorsal channel deep, lateral tubercles small; punctuation dense and rather coarse, each puncture bearing a narrow appressed brown scale-like hair. The median channel bears numerous pale brown scales and there is an imperfect line of similar scales just within the lateral tubercles. Elytra moderately elongate, deeply striate, intervals nearly flat and rugose, each with two lines of brown hair-like scales, and with very large rotundate whitish scales, scattered singly over the surface; scutellar spot involving the first and second interspaces, the scales similar in color to, but less broad than the isolated scales of the elytra. Legs and lower surface clothed with intermixed scales and stout hairs for the most part pale in color. Femora with a tuft of scales in the position of the usual tooth, which is probably present though concealed by them. Claws with a moderate tooth. Length 2.8 mm.; width 1.6 mm.

Pecos; June. A single specimen sent by Prof. Cockerell.

This species appears to be closely related to *rudis*, but seems different in several details. Neither LeConte nor Deitz specifically mention the very large rounded scales of the elytra in *rudis* and they could hardly have failed to do so if present.

Centorhynchus solitarius n. sp.—Oval, piceous, last two joints of tarsi pale; upper surface moderately densely clothed with narrow or piliform scales, dark brown in great part, interspersed with similar whitish scales which are sparse and inconspicuous on the disk, but become numerous in the median groove and at the sides of the prothorax, and toward the lateral and apical margins of the elytra, where they predominate. There is a narrow scutellar spot of overlapping pure white scales, occupying the sutural interspaces for somewhat

less than one-third their length. Beneath with uniform whitish scales, which are broader than those above and closely placed, though as a rule not quite in mutual contact. Beak (♂) moderate, closely punctate at sides, substriate toward the base, numerously squamo-setose almost throughout, the setæ becoming more hair-like apically. Antennæ inserted just behind the apical third, funicle 6-jointed. Head closely punctate, not densely squamose with pale scales, vertex carinate. Prothorax of the usual form, the sides subparallel for a short distance at base, median groove fine and shallow, lateral tubercles small but distinct, surface densely not coarsely punctate, scales narrow, numerous but distinctly separated, directed toward the median line in front, radiating from a median spot posteriorly. Femora with a small tooth; tibiæ unguiculate in the male; claws feebly toothed at base. Last ventral segment with a broad and rather deep fovea in which the vestiture becomes hair-like, especially along its margins. Length 2.5 mm.

Gunnison County, Colorado; Baker.

The 6-jointed funicle, toothed femora and toothed claws exclude this species from any of the groups as limited by Dietz. It should stand between the "*subpubescens*" and "*angulatus*" groups of this author.

Ceutorhynchus tescorum n. sp.—Oval, piceous, legs rufous throughout; upper surface rather densely clothed with short piliform scales, which are not very closely appressed and are dark brown and yellowish-white or ashy in color. The pale scales are condensed in the pronotal channel and along the elytral apices; and there is an elongate sutural spot of dense white scales, occupying the sutural interspace only and between one-fourth and one-fifth the length of the suture. Under surface with closely placed whitish oval scales, legs clothed with coarse whitish hair or piliform scales. Beak not very slender, finely punctulate apically, nearly smooth above at tip; more coarsely punctate and feebly substriate at base; antennæ inserted at the middle (♂), or just behind the middle (♀), funicle 6-jointed. Head densely punctate and closely set with pale yellow piliform scales, front scarcely at all concave, occiput carinate. Prothorax scarcely one-third wider than long, sides subparallel basally, strongly convergent anteriorly, the apical constriction moderate, apical margin feebly elevated, punctuation dense but not coarse, largely concealed by the vestiture, which is dark brown above, with a pale line in the not very deep median channel, and sometimes a few scattered pale scales on the disk. Elytra about two-fifths wider than the prothorax. Striæ not deep, intervals wide, nearly flat, vestiture mottled on the disk, dark scales nearly wanting at apex. Femora not toothed; claws with a very small basal tooth. Length 2.5-3 mm.; width about 1.7 mm.

Western Nevada (Ormsby Co., Baker); Eastern California, Inyo Co., Bridgeport (Wickham); Big Pine and Independence (Fenyes).

The 6-jointed funicle, simple femora and toothed claws form a combination which excludes this species from all of the groups indicated by Dietz. It may be placed between the "*squamatus*" and "*septentrionis*" groups of this author.

List of New Species Herein Described.

CARABIDÆ.

Tachys cockerelli.

STAPHYLINIDÆ.

Staphylinus modestus.
Euæsthetus neomexicanus.
Heterothops mediocris.
Neomedon piciventre.
Stilicus oblitus.
Palaminus amplipennis.

COCCINELLIDÆ.

Hyperaspis hæmatosticta.

CUCUJIDÆ.

Narthecius monticola.
" striaticeps.

NITIDULIDÆ.

Epuræa alticola.

MONOTOMIDÆ.

Europs striatulus.

BYRRHIDÆ.

Pedilophorus subsetosus.
" subcupreus.
" lateralis.

PARNIDÆ.

Elmis pecosensis.
" addendus.
" antennatus.

ELATERIDÆ.

Limonius sinuifrons.
Athous nugalis.
" recticollis.
" speculifer.
" quadricollis.
" palpalis.
" discors.
" agriotoides.
" rufotestaceus.
" jejunus.
Aphricus luteipennis.
Cebrio compositus.

BUPRESTIDÆ.

Chrysobothris convexa.
Agrilus townsendi.

LAMPYRIDÆ.

Telephorus insipidus.
Polemius regularis.
" binotatus.

MALACHIIDÆ.

Trichochrous sophiæ.
" mixtus.
" incultus.
" placatus.
" similis.
" bicoloripes.
" prosternalis.

CLERIDÆ.

Clerus corallinus.

SCARABÆIDÆ.

Psammodius ambiguus.
Aphodius moquinus.
" abusus.
" crassuloides.
" neotomæ.
" rotundiceps.
" umbricollis.
" plutonicus.
" longitarsis.
" dialytoides.
Ochodæus gnatho.
" nimius.
Dichelonycha testaceipennis.
" mormona.

CERAMBYCIDÆ.

Leptura kerniana.
" subcostata.
" barberi.
" cockerelli.
" insignis.

CHRYSOMELIDÆ.

Luperodes semiflavus.
Chætocnema costata.

TENEBRIONIDÆ.

Parateuetus crinitus.

MELANDRYIDÆ.

Carebara brevicollis.
" californica.

MORDELLIDÆ.

Mordella fuscocinerea.
" perlineata.
Mordellistena festiva.
" pallens.
" errans.
" sericans.
" suspecta.
[" divisa Lec. Removed from synonymy.]

MELOIDÆ.

Zonitis martini.
" vigilans.
Epicauta ingrata.
" ruidosana.

RHIPIPHORIDÆ.

Myodites vierecki.

OTIORHYNCHIDÆ.

Ophryastes symmetricus.
Anametis subfusca.
Cimbocera conspersa.
Pandeletejus rotundicollis.
" simplarius.
" subtropicus.
Cyphomimus ochreus.

CURCULIONIDÆ.

Trichalophus arcuatus.
Phyllotrox quadricollis.
Hypoleschus atratus.
Otidocephalus rhois.
Epimechus nanulus.
" stragulus.
Conotrachelus invadens.
Acalles indigens.
Ceutorhynchus notatulus.
" solitarius.
" tescorum.

ERRATA.

Page 145, last line, for type *read* types.
" 149, line 2, for east *read* west.
" 153, line 22, for *axiliaris* read *axillaris*.
" 153, line 31, for *Elensis* read *Eleusis*.
" 160, last line, for Abiguin *read* Abiguiu.
" 165, line 3, for Chaleva read Choleva.
" 166, " 35, for Payk.A. lbuquerque *read* Payk. Albuquerque.
" 173, " 35, for Hololopta read Hololepta.
" 180, " 7, for california read californica.
" 180, " 27, for (W.), *read* (Wooton).
" 183, " 37, for Leptorectura read Leptovectura.
" 184, " 27, after atriventris Lec. add = C. nigriventris above.
" 184, " 28, after undulatus Say add = Thanasimus undulatus below.
" 187, " 34, for Arrogo *read* Arroyo.
" 189, " 4, for lanceolota read lanceolata.
" 189, " 24, for Pescoa *read* Pescao.
" 215, " 4, for Hypaleschus read Hypoleschus.
" 220, " 4, for distinct *read* distant.
" 250, " 16, for larger *read* longer.

A PRELIMINARY LIST OF THE ASILIDÆ OF NEBRASKA, WITH DESCRIPTION OF NEW SPECIES.

BY PAUL R. JONES, UNIVERSITY OF NEBRASKA.

Most of the material upon which this paper is based was collected in the northwestern part of the State during the past two years. Although there are a good many forms represented in this paper the number is low in comparison with what might be secured by more careful collecting. The entire State seems to be especially adapted to a large development of the family Asilidæ. The Dasypogoninæ and Asilinæ are the best represented, although many rare Laphrinæ have been found. The present paper may contain some errors, but the author has taken pains to insure the correct determinations in all cases. Many of the species, which are undoubtedly new, have been left unnamed for lack of sufficient material. I wish here to thank Dr. Williston, to whom I am greatly indebted for certain determinations and valuable suggestions with reference to generic and other relations.

1. **LEPTOGASTER** Meigen.

Leptogaster murinus Loew.

Two males and three females from Springview Bridge, Brown Co., Nebraska, June 10, 1902 (J. C. Crawford and W. D. Pierce).

2. **OSPRIOCERUS** Loew.

Ospriocerus abdominalis Say.

Numerous specimens from Sioux Co., Nebraska, which vary from 13–19 mm. in length.

3. **SCLEROPOGON** Loew.

Scleropogon helvolus Loew.

Numerous specimens from Glen, Sioux Co., Nebraska (P. R. Jones). The first joint of the antennæ is yellowish red, second reddish brown, and the third black, style about one half the length of the third joint.

Scleropogon similis n. sp.

Near *S. helvolus*.—♀. Length of body 24 mm.; of wings 12 mm. When compared with *S. helvolus* the antennæ are shorter, third joint broader and less than the length of the first two joints together. Style as long as the third joint, first two joints yellowish-red, apex of second darker, third joint and style black. The specimen is somewhat rubbed, but where the pollen can be seen it is similar to that of the preceding species. Wings hyaline, first posterior, fourth posterior and anal cell closed, the two former petiolate. Hypopleura with a patch of bristles.

Type.—One female from Valentine, Nebraska.

4. **STENOPOGON** Loew.

Stenopogon acacidinus Williston.

Two females from Lincoln, Nebraska, July (H. S. Smith). The specimens agree with the description of the male, except that they are respectively 17 and 20 mm. in length. Formerly recorded from three males from Kansas.

Stenopogon consanguineus Loew.

Numerous specimens from Glen, Sioux Co., Nebraska (P. R. Jones). This species is common in northwestern Nebraska in the fall.

Stenopogon inquinatus Loew.

Specimens from Glen, Sioux Co., Springview Bridge, Brown Co., West Point and Lincoln, Nebraska. The specimens vary from light colored specimens with a yellow abdomen to dark colored specimens with a brownish-black abdomen. The first posterior cell is nearly closed in some specimens, while in others it is wide open. The antennæ are not typical for the genus *Stenopogon*, the third joint being about the length of the first two together, and the arista more than one-half the length of the third joint. The hypopleura do not have a patch of bristles, which Mr. Coquillett thinks is a better character for separating *Stenopogon* from *Scleropogon* than the length of the style.

5. **LAPHYSTIA** Loew.

Laphystia sp.

Ten females from Lincoln, Nebraska, June and July, and War Bonnet Canon, Sioux Co., Nebraska, which present such a bewildering number of variations that I am unable to refer them to any of the species from North America. They vary in wing venation from having the first posterior cell slightly narrowed, through one closed in one wing and nearly closed in the other to both closed. They

vary in the color of the legs from nearly entire reddish-yellow to specimens in which only the extreme base of the femora and apex of the tibiæ are reddish. The second joint of the antennæ is about two-thirds as long as the first joint, third joint broad, style composed of two joints, second joint about two and one-half times as long as the first and hollowed out on the upper outer side, and in the center of this depression there is a microscopic bristle. Front, face, thorax and pleura covered with grayish pollen, that of the face slightly yellowish. Pile everywhere light colored. Abdomen shining, banded posteriorly with pollinose cross-bands which are nearly interrupted in the middle, but wide on the lateral margins.

Laphystia sp.

Two males and a female from Sioux Co. and a male from Halsey, Nebraska, which appear to differ from the above species, but cannot be separated by any good characters. They are smaller, more slender, the head appears wider on account of the more slender abdomen, abdomen more shining metallic, the cross bands more silvery. In the female specimen from Sioux Co. the face is yellow pollinose, while it is silvery in the one from Halsey, the other specimens show variations in between. The structure of the antennæ is the same as in the preceding species. A male and a female from Lincoln, Nebraska, and the sand hills seem to be intermediate between the two species.

Dr. Williston has kindly referred these specimens to the genera *Laphystia* and *Triclis*.

6. **TRICLIS** Loew.

Triclis flavipilis n. sp.

♀. Length 10 mm. Black, shining with a bluish tint. Front wide, deeply excavated, ocelli on a prominence, yellowish-red pollinose, bristles on each side and those of the ocelli black. Face thickly yellowish-red pollinose, when viewed in profile no convexity can be seen beyond the margin of the eyes until half-way below the antennæ where the gibbosity is very pronounced. Mystax not extending above the gibbosity, black on the upper part and yellowish-red on the lower part near the oral margin, a few reddish hairs immediately below the base of the antennæ. Antennæ black, first joint longer than the second, third not as long as the first two together, style a little more than a fifth of the third joint, second joint of style more than twice as long as the first, hollowed out on the upper side from which a microscopic bristle arises; first two joints of antennæ with black and reddish pile and longer black bristle-like hairs on the under side of the first joint. Occiput with reddish pollen, occipito-orbital bristles black, pile of the occiput, oral margin and beard fine, grayish-white in color, that of

the occiput having a reddish tint. Thorax black, shining, covered with short dense yellowish-red pile, longer on the posterior margin, a few bristles on the lateral margins black. Scutellum of similar color and covered with pile of similar color to that of the thorax, with a row of thin, light colored bristles on the posterior margin. Pleura black, covered with dense yellowish-white pollen and sparse light colored pile, a shining spot on the mesopleura extending obliquely downward toward the front coxæ. Halteres and a fan-like row of bristles in front yellowish-white. Abdomen shining black, with a bluish tint, and covered with fine, dense yellow pile not easily seen unless viewed from profile. Pile of first two segments and lateral margins of the rest longer. Posterior lateral margin of all the segments golden pollinose, less so on the posterior segments. Second segment of the abdomen short, about as long as the first. Tip of abdomen with a circle of long bristle-like hairs. Legs black, coxæ grayish-white pollinose. Coxæ and femora with whitish pile, that of hind femora with a reddish tinge, tibiæ and tarsi with shorter pile of a more reddish tinge, bristles of tibiæ and tarsi a trifle lighter than those of the femora, a few on the tarsi black. Wings uniformly blackish.

Type.—One female from Meadow, Nebraska, July, 1906 (P. R. Jones).

The wing venation of this species is identical with that of the figure of *T. tagax* Williston, given in TRANS. AM. ENT. SOC., Vol. XI, pl. 1, fig. vi. The gibbosity of the face on the lower part is similar to that of fig. 6*a* of the head, but the upper part and antennal prominence are barely visible when viewed from profile. The third joint of the antennæ is not as broad as that of *T. tagax*. I will place this species in this genus, although I think the genus *Triclis* should not stand unless separated from *Laphystia* by some other character than the closed posterior cell, which I found so variable in the preceding species.

7. **ECHTHODOPA** Loew.

Echthodopa pubera Loew.

Specimens from Lincoln, West Point, Harlan and Sioux Counties, Nebraska.

8. **DIOCTRIA** Meigen.

Dioctria rufipes n. sp.

♀, ♂. Length 7-9 mm. Black, shining, wings blackish, yellowish at the base, nearly bare species. Front and face black, covered with fine reddish-yellow pile, face flat, gently receding to the oral margin; when viewed from profile a slight convexity can be seen at the base of antennæ and oral margin; when viewed from the front, broad, nearly straight, but a trifle concave. Mystax sparse, light colored, confined to the oral margin, beard sparse whitish. Occiput and orbital margin covered with dense silvery pollen. Antennæ black, first joint nearly twice as long as the second; third (without style) nearly one and one-half times as long as the first two together, style about as long as the second

joint, robust, and discernable only when viewed with at least a low power microscope, third joint beyond the middle with a small spine directed forward and with a slight depression just beyond the spine. Thorax black, shining, with a bluish tint, covered with very fine red pile through which two black median stripes appear separated by a stripe of red pile, two lateral shining spots on the dorsum nearly oval in shape. (The pile on the thorax and scutellum has been rubbed off somewhat from the specimen at hand.) Scutellum of the same color as the thorax, with a few pale colored bristles on the posterior margin similar to those on the posterior part of the thorax. Pleura covered with whitish pollen, becoming yellowish on the upper part. Halteres light yellow. Abdomen shining black, with a coppery reflection, nearly glabrous to the eye, finely punctured, and covered with very fine, decumbent, red pile, seventh segment in female, seventh and posterior half of sixth in male reddish, a silvery pollinose spot on the posterior lateral margins of the second, third, fourth and fifth segments. Legs red, apex of hind tibiæ and apex of all tarsi black, pile and the few bristles light red. All the posterior cells and anal cell narrowly open.

Types.—A male and a female from Glen, Sioux Co., Nebraska, August 15, 1906 (P. R. Jones).

This species is evidently quite close to *Dioctrodes flavipes* Coquillett, but I believe it is distinct and belongs to the genus *Doctria*.

9. **CYRTOPOGON** Loew.

Cyrtopogon plausor Osten Sacken.

Two males from Sioux Co., Nebraska, which answer in every way to the description, except that all the tibiæ save the apex and all the tarsi are reddish. The base of all the femora have reddish cast.

Cyrtopogon sp.

Two females, which fall in Group A of Osten Sacken's synoptic table, and which are probably near *C. aurifex* O. S. Length 12.5 mm. Hair on the face whitish on the upper part, near the mouth black, and a few black hairs above. Antennæ black, third joint reddish, first two joints with black hairs, third on upper side with a few whitish hairs. Thorax brownish pollinose, with a median geminate stripe, and two lateral wider stripes or spots. Abdomen black, shining, lateral margins of the segments covered with yellowish-white pile, becoming nearly obsolete on the last three segments, a silvery pollinose spot on the posterior lateral angles of the second, third, fourth and fifth segments. A fan like row of white bristles in front of the yellow halteres. Legs black, tibiæ red, except apex, bristles black, pile chiefly light colored, slightly intermixed with black. Wings hyaline, with a brownish tinge.

10. **LASIOPOGON** Loew.

Lasiopogon quadrivittatus n. sp.

Near *L. arenicola* O. S. ♀. Length 9–11 mm. Black, covered everywhere with dense grayish pollen. Front broad, densely gray pollinose, hair everywhere whitish, that of occiput with a more decided yellowish tinge, beard and hair on occipital margin fine, silky and purer white. Face in profile with a strong gibbosity reaching more than half the distance from the oral margin to the base of the antennæ. Antennæ black, first two joints nearly equal, second a trifle longer than the first, third longer than the first two together, style about one-half as long as the third joint, first two joints of the antennæ with whitish hair. Thorax black, covered with dense grayish pollen and very fine white pile, a few light colored bristles on the lateral margins and posterior part of the dorsum, four brownish nearly median stripes on the dorsum, diverging anteriorly, the pollen on the lateral margins brownish, forming an obscure stripe. The interval between the inner stripes is wider than that between the others so that there appears to be two geminate stripes. Scutellum flat, covered with pollen similar to that of the thorax, and with a row of light colored bristles on the posterior margin. Pollen of the pleura gray, with a brownish tinge. Halteres yellowish, the fan-like row of hairs in front white. Abdomen black, covered with dense grayish pollen and very fine, short, decumbent whitish pile, anterior margins of the second, third and fourth segments reddish-brown, last segment shining black. Bristles on the posterior lateral margins of the first segment whitish. Legs black, covered with dense, fine, whitish pile, longer on the under side of the femora, and interspersed with a few light colored bristles. Coxæ and legs with brownish-gray pollen, thicker on the coxæ, coxæ with long white pile. Wings hyaline, anal cell closed and petiolate, fourth posterior cell slightly narrowed at the margin of the wing, anterior cross-vein at the middle of the discal cell.

Type.—One female from Halsey, Nebraska, June 1, 1906 (H. S. Smith).

Paratypes.—One female from War Bonnet Canon, Sioux Co., Nebraska, May 27, 1901 (M. A. Carriker); and one female from Bad Lands, Mouth of Monroe Canon, Sioux Co., Nebraska, May 28, 1900 (L. Bruner).

This species can be readily distinguished from *L. arenicola* O. S. in being more densely pollinose and not so densely pilose as that species. The thoracic stripes will also serve to separate them, and my specimens of *L. arenicola* from Southern California have a few black bristles on the lateral margins of the thorax which *quadrivittatus* does not have.

11. **HOLOCEPHALA** Jaennicke.

Holocephala abdominalis Say.

Specimens from Cedar Bluffs and Meadow, Nebraska.

This is the first record of this species being taken this far west.

12. **HOLOPOGON** Loew.

Holopogon seniculus Loew.

Specimens from Glen, Sioux Co., Nebraska (P. R. Jones).

13. **PYCNOPOGON** Loew.

Pycnopogon cirrhatus Osten Sacken.

Two males from War Bonnet Canon, Sioux Co., Nebraska, which answer in every way to the description, except that the tip of the abdomen is red. The specimens are also larger, being about 12 mm. in length.

14. **STICHOPOGON** Loew.

Stichopogon trifasciatus Say.

Two males and two females from Glen, Sioux Co., Nebraska (P. R. Jones).

15. **HETEROPOGON** Loew.

Heteropogon nigripes n. sp.

♀. Length 9 mm. Near *H. lautus* Loew. Head broader than high, front but slightly excavated, front and face white pollinose, covered with long white hair, above the mouth and near the ocellar prominence black. Face flat, slightly convex below, wide. Antennæ black, first and second joints equal, third slightly longer than the first two together, style slender, about two-thirds the length of the third joint. Thorax black (slightly greased in the specimen at hand), covered with long light colored pile, pleura whitish pollinose, covered with long white pile, scutellum similar in color to the thorax, but with a brownish tinge, covered with long white pile and a marginal row of weak bristle-like hairs, dark at base and white at apex. Halteres dark brown or black, stem slightly lighter, fan-like row of hairs in front white. Abdomen black, shining, dorsum covered with very fine, short, sparse, light colored pile, lateral margins with long white pile, posterior lateral margins of first six segments with a white pollinose spot. Legs black, covered with long light colored pile, weak bristles of tibiæ light colored, pile of tibiæ and tarsi yellowish, shorter and denser than that of the femora. Wings hyaline, veins at base of submarginal, first, second, fourth and fifth posterior and discal cells clouded with black.

Type.—One female from Monroe Canon, Sioux Co., Nebraska (L. Bruner).

This species can be separated from *H. lautus* by its having the legs entirely black, and the pilosity of legs being different.

16. **SAROPOGON** Loew.

Saropogon adustus Loew.

A female from McCook, Nebraska, which I believe to be this species. The legs are entirely yellow, but the apex of the third joint of the antennæ is black. Wings hyaline, with a yellowish tint, apex blackish.

16. **DEROMYIA** Philippi.

Deromyia angustipennis Loew.

Numerous species from Glen Sioux Co., and Lincoln, Nebraska. Common in the eastern and northern parts of the State.

Deromyia platyptera Loew.

Three males and three females from Peru and Union, Nebraska. The females agree with the description of the male, except that they are much lighter, including the wings. This seems to be the only difference however. Formerly recorded from a male from Illinois.

18. **COPHURA** Osten Sacken.

Cophura cristata Coquillett.

A male specimen which I would refer here, although upon comparing it with a male and a female from Colorado it it quite different in general appearance. The Colorado specimens differ from the Nebraska specimen by having longer and denser hair, a more prominent gibbosity of the face and a denser mystax, which extends nearer to the base of the antennæ. All of the specimens instead of having four marginal bristles on the scutellum have about eight weak marginal bristles. All the other characters agree with the description. The species must be quite variable.

19. **CEROTAINIA** Schiner.

Cerotainia atrata n. sp.

♀. Length 7 mm. Black, shining, finely punctate, nearly glabrous. Front broad deeply excavated, covered with grayish pollen and whitish hairs, ocelli on a prominence. Face flat in profile, covered with yellowish-gray pollen, denser and more grayish on the sides, mystax thin, composed of a few yellowish-white hairs on the oral margin, sparse white pile extending to the antennæ, bristle-like hairs on the occiput yellowish, scant beard and hair on the orbital margin white. Antennæ black, first and third joints equal, second short, first two joints covered with black hair. Eyes disciform, with enlarged facets in front. Thorax and scutellum finely punctate, covered with very short, fine, dense, yellowish-red pile, nearly glabrous to naked eye. Mesopleura with yellowish-red pile, sternopleura with whitish pile and grayish pollen. Halteres lemon-yellow, and fan-like row of hairs in front white. Abdomen black, shining, coarser and more deeply punctured than the thorax, covered with fine, short, yellowish-red pile, which is longer and somewhat whitish on the lateral margins of the segments. Legs black, tibiæ and tarsi dark red, on the upper side and nearly all of the hind tibiæ brownish. Pile of the legs white. Wings uniformly blackish, veins at the end of the distal end of the discal and fourth posterior cells continuous in the same straight line, first posterior cell not narrowed, second somewhat narrowed, fourth posterior and anal cells closed and petiolate.

Type—One female from Meadow, Nebraska, July, 1906 (P. R. Jones).

This species can be separated from *C. macrocera* by having darker wings and differently colored pile on the abdomen; from *C. nigra* and *C. dubia* by having darker wings, lighter halteres and differently colored pile on legs; from *C. nigripennis* by the difference in the color of the wings, differently colored pile near the ocelli, differently colored pollen on the face, shorter pile on the thorax, and by the abdomen having the fifth and sixth segments clothed as the preceding segments.

20. **ATOMOSIA** Macquart.

Atomosia glabrata Say.

One male from Omaha, a female from Haigler, and a female from West Point, Nebraska. Formerly recorded from Pennsylvania and the Atlantic States.

Atomosia soror Bigot.

Two males and a female from Harlan Co., Nebraska, which have dense yellow pile on the thorax and abdomen (longer on the thorax). Legs pale yellow. Antennæ lighter colored and longer than antennæ of *A. glabrata* (especially the third joint). Formerly recorded from Mexico.

21. **POGONOSOMA** Rondani.

Pogonosoma dorsatum Say.

Specimens from Lincoln and Glen, Sioux Co., Nebraska, August and September.

22. **NUSA** Walker.

Nusa fulvicauda ? Say.

One male specimen which I refer to this species, although I have some doubts as to its belonging here, and of which I will give a description. It answers to Say's description in a general way.

♂. Length 17 mm. Shining blue-black, abdomen with cobalt reflections. Front deeply excavated, ocelli prominent, bisetose. Face somewhat convex below, white pollinose, covered with long white hair, mystax composed of long, stout, black bristles, which extend nearly to the base of the antennæ, beard and hair on cheeks long, silky white. Antennæ black, first joint nearly twice as long as the second, third about as long as the first two together, dilated at the apex and covered with very short, silky, reddish pile. First and second joints short, white pilose and with long black bristles, those on the under side longer. Inner eye margins opposite the base of the antennæ and a little above with a row of black bristles. Thorax shining blue-black, covered with brownish pollen, pile short, black, a few black bristles on the lateral borders and posterior part, two median dark stripes separated by a pollinose stripe and two lateral oblong dark

spots or stripes. Pleura covered with long white hair. Scutellum of same color as thorax, covered with short, black pile, and having a marginal row of black bristles. Halteres reddish-brown, fan-like row of hair in front white. Abdomen shining blue-black, with cobalt reflections, fifth and sixth segments reddish-yellow, which color can be seen obscurely on the second, third and fourth segments, dorsum covered with short, dark colored pile, on the last three segments with lighter colored pile, lateral margins of all segments with long white pile, which on the first three segments becomes longer and covers a wider space. Lateral margins of the first segment with two bristles, second segment with three, third and fourth segments with one bristle. Legs shining black, covered with long white hair, bristles of tibiæ, tarsi and two on the apex of the hind and middle femora black, hind femora slightly thickened distally, hind tibiæ slightly curved. Wings hyaline, veins black, brownish along the veins.

One male from Glen, Sioux Co., Nebraska, August 14, 1906 (P. R. Jones).

23. **LAMPRIA** Macquart.

Lampria rubiventris Macquart.

Two males and two females from Carns, and a male from Lincoln, Nebraska, which I am inclined to believe belong here. All the specimens have black antennæ, yellow mystax (with a few black hairs in the female), and dense golden pubescence on the thorax. Legs black, front tibiæ and tarsi yellow, hind tibiæ brownish red. In the male specimens from Carns the abdomen is entirely yellow, while in the female from Carns the three segments are yellow, with the remaining segments brownish-black, showing a yellowish tint. The male specimen from Lincoln has the entire abdomen reddish-yellow. Formerly recorded from Pennsylvania, Georgia and Texas.

24. **DASYLLIS** Loew.

Dasyllus astur Osten Sacken.

Specimens from Lincoln, West Point and Saltillo, Nebraska. The specimens show considerable variation in the extent of the yellow pile on the tibiæ.

Dasyllis fernaldi Back.

Numerous specimens from Sioux Co., Nebraska. This species is our most common species in the northern part of the State during the summer months. It presents a striking resemblance to *Bombus huntii* Greene, which is also an inhabitant of that part of the State. I also have specimens from Colorado and Custer, South Dakota. Formerly recorded from Colorado.

Dasyllis sacrator Walker.

Two males, one from Carns, Nebraska, July 6, 1902, and the other from Lincoln, Nebraska, May 30, 1905. The Lincoln speci-

men has the pile entirely black, while the other one has some yellow pile on the apex of the front and middle femora and base of the front and middle tibiæ. The yellow pile of the abdomen is chiefly on the second and third segments, a few hairs on the first and fourth segments.

25. **LAPHRIA** Meigen.

Laphria gilva Linne.

Specimens from War Bonnet Canon and Monroe Canon, Sioux Co., Nebraska.

26. **PROCTACANTHUS** Macquart.

Proctacanthus milbertii Macquart.

Numerous specimens from Lincoln, Sand Hills and Glen, Sioux Co., Nebraska.

27. **ERAX** Scopoli.

Erax cinerascens Bellardi.

Numerous specimens from Glen and Harrison, Sioux Co., Nebraska, and Gordon, Sheridan Co., Nebraska. The specimens which I have show considerable variety in the color of the bristles around the ocelli and of the scutellum. They agree with Williston's description of *E. furax* better than with Bellardi's description of *cinerascens*, and when viewing a whole series from the front are much lighter colored than in *E. stamineus*. The palpi are black, black pilose, with a few white hairs at the base.

Erax stamineus Williston.

Numerous specimens from Glen, Sioux Co., Nebraska. The female agrees with the description of the male, except that the ocellar and occipito-orbital bristles are usually white or yellowish-white, dorsum of the thorax yellow pollinose, and bristles of the scutellum white instead of black, as is usual in the male. The abdomen lacks the silvery pile, but is covered with yellowish-gray pollen and marked like the female of *E. cinerascens*. Palpi in both sexes are black, with yellow or yellowish white pile. The females are difficult to separate from the females of *E. cinerascens* when comparing individual specimens, but when examining a series the specimens of *E. cinerascens* appear much whiter or grayish, while those of *E. stamineus* appear more yellowish. They can be separated by the difference in the color of the pile on the palpi; in *E. cinerascens* it is black, and in *E. stamineus* yellow or white. Formerly recorded from two males from Montana.

Erax sp.

One female from Glen, Sioux Co., Nebraska, which appears to be near *E. cinerascens*, but is smaller, the pollen slightly more yellowish, the second submarginal cell is slightly shorter, and the tibiæ and tarsi dark red, and the apex of the tibiæ nearly black.

28. **MALLOPHORA** Macquart.

Mallophora guildiana Williston.

Specimens from Gering, Sioux Co., and Gordon, Sheridan Co., Nebraska, which agree with the description, except that in all the specimens the first posterior cell is closed and petiolate. There is some variation in the color of the pile, being nearly yellow in those collected on *Solidago*, and nearly white on those collected on *Cleome*.

29. **PROMACHUS** Loew.

Promachus bastardii Macquart.

Two males from McCook, one from West Point, and a female from Glen, Sioux Co., Nebraska, which agree with the description given by Williston, except that the lateral black bristles on the second abdominal segment are absent, and those on the lateral margins of the first segment are white. This is the first record of this species being taken in the Western States.

Promachus fitchii Osten Sacken.

Two females from War Bonnet Canon, Sioux Co., Nebraska, which agree with Williston's description, except that they are about 39 mm. in length.

Promachus vertebratus Say.

Specimens from Lincoln, Union, Weeping Water, Malcom and West Point, Nebraska.

30. **STENOPROSOPUS** Macquart.

Stenoprosopus ? n. sp.

Length 9 mm. Face and front narrow, face wider below, vertical in profile, mystax composed of a few yellowish-white bristles on the lower part of the face. Pollen over the entire body light brownish-yellow, lighter on the head. Antennæ black, second joint about two-thirds as long as the first joint, third shaped somewhat as in *Tolmerus notatus* Wied., about as long as the first two joints together, style short, about as long as the second joint, not one-half as long as the third joint. Thorax (badly rubbed), marked as in *Tolmerus notatus*. Scutellum with a distinct groove before the apex, and two bristles on the posterior margin. Halteres light yellow. Abdomen black in ground color, covered with dense yellowish gray pollen, posterior margins of the segments obscurely reddish-yellow. Ovipositor small, shining black, yellow on the venter, compressed, a tuft of hair at the tip. Legs black, tibiæ yellow at the base, and tarsi obscurely reddish at base. Pile and bristles on whole body light colored. Wings hyaline, grayish at the apex.

One female from Sioux Co., Nebraska, and a female from Fort Assinniboine, Montana.

I shall not name these specimens because of a lack of sufficient material.

31. **TOLMERUS** Loew.

Tolmerus callidus Williston.

Two females and a male from West Point, Nebraska, which I believe belong here. They resemble the following species, but the pollen of the face and thorax is more yellowish, the femora black, with a red ring at the apex, tibiæ red, with a black spot on the inner side. The third joint of the antennæ more slender, style not as long as the third joint.

Tolmerus notatus Wiedemann.

Numerous specimens from West Point and Glen, Sioux Co., Nebraska.

Tolmerus n. sp.

Three females from Glen, Sioux Co., Nebraska, August 17, 1906 (P. R. Jones), which are related to the preceding species, but seem to be different. The third joint of the antennæ is more pointed or lance-shaped, occipito-orbital bristles white, femora except a black spot on the outer side (more extensively on the hind femora), tibiæ except the apex and metatarsi red, tarsi dark brown or black. The posterior margin of the scutellum has two bristles. The pollen is everywhere grayish-white, except on the dorsum of the thorax and abdomen, where it is brownish, being slightly yellowish also on the thorax. In all the other characters this species resembles the preceding one. I shall not name it because of a lack of sufficient material.

Tolmerus ? n. sp.

A female from Weeping Water, Nebraska, July 10, 1905 (H. S. Smith).

The specimen seems to resemble the preceding species in a general way, but differs by having the front and face wider, the gibbosity more abrupt, and a great deal more prominent. The pollen of the front and face is yellowish, mystax black, with a few white hairs interspersed throughout the middle. Occipito orbital, ocellar bristles and a row of bristles on the inner eye margin black, beard dense, whitish. Palpi black, with black hairs. Antennæ slightly shorter than in *T. notatus*, black, second joint less than one-half as long as the first, third lance-shaped, slightly shorter than the first joint,

style long, longer than the first joint, about as long as the second and third joints together. Thorax with pollen similar to that on *T. notatus*, and marked similarly, more gibbose. Scutellum covered with brownish-yellow pollen and white pile, on the posterior margin with a row of weak bristles. Halteres brownish-yellow, stem lighter. Abdomen covered with brownish-gray pollen, each segment with a large median, nearly quadrate, subfulgent brown spot occupying nearly all the segment, but not touching the lateral or posterior margins. Ovipositor long, compressed, slightly more than the length of the last four segments. Legs black, more robust than in *T. notatus*, all the tibiæ except the apex reddish. Wings shorter than *T. notatus*, hyaline, tinged with brownish, stump of anterior branch of the third vein extending inwardly as in the species of *Erax*, posterior branch of third vein somewhat curved forward but not reaching the tip of the wing, first posterior cell wider at the distal end than is the second submarginal cell.

I shall not name this species because of a lack of sufficient material.

31. **ASILUS** Linne.

Asilus annulatus Williston.

Specimens from West Point, Meadow, Glen and Harrison, Sioux Co., Nebraska, which agree quite well with the description, but the occipito orbital bristles as well as the bristles on the legs are white in some of the specimens.

Asilus novæ scotiæ Macquart.

Specimens from Lincoln and Glen, Sioux Co., Nebraska, August and September, which seem to answer to the description, except that the front and thorax are ochraceous pollinose, and the bristles on the dorsum and on the legs are both black and white, and the long bristles on the front tibiæ and tarsi are light colored. The occipito-orbital bristles on some specimens are light yellow, on others mixed black and yellow, and on still others nearly all are black.

Asilus flavipes Williston.

One female from War Bonnet Canon, Sioux Co., Nebraska, which agrees with the description of the male. Formerly recorded from Connecticut and Pennsylvania.

33. **RAHDIURGUS** Loew.

Rhadiurgus leucopogon Williston.

Numerous specimens from Glen, Harrison and War Bonnet Canon, Sioux Co., and Gordon, Sheridan Co., Nebraska.

THE NORTH AMERICAN SPECIES OF THE GENUS ORNIX Tr.

BY WM. G. DIETZ, M.D.

(Plate IV.)

A well defined genus of the Micro-lepidopterous family Tineidæ, characterized as follows: head rough-haired, more or less appressed on the face, two large tufts on the vertex, directed more or less forward. Antennæ as long as the forewings, simple, basal joint without pecten. Labial palpi moderately long, smooth scaled, curved and more or less ascending; third joint pointed, shorter than the second. Maxillary palpi distinct, porrect and of moderate length. Forewings elongate-lanceolate; vein 1*b* not furcate at base, 11 veins, 3 absent, 6 and 7 usually stalked, latter to costa. Hindwings narrower than the forewings, narrowly lanceolate, cilia 2–3; vein 3 sometimes absent, cell open between 4 and 5, 5 and 6 sometimes stalked.

Of the species heretofore enumerated in our lists, but few are definitely recognized; this is due in part to faulty description, which leaves the identity of a species in serious doubt, and again to the fact that several of Clemens' species were described from captured specimens, their food-plant being unknown, and the type, either lost or in such a condition as to make identification impossible. *Ornix acerifoliella* does not belong here, but is the type of *Paraclemensia* Busck. *O. quercifoliella* Ch. belongs to *Gracilaria—Dialectica* Wlsh.—and is a synonym of *Gracilaria strigifinitella.*

Thus far I have seen no representatives of the genus from the Pacific Slope. The species appear to prefer the temperate and more northern regions. If those who are interested in the furtherance of our knowledge of the Micro-lepidoptera of our fauna will give more close attention to the breeding of material, I have no doubt that many more species will be discovered than are here enumerated, and almost all of which were bred from the immediate vicinity of the writer.

The species arrange themselves into two natural groups. The first of these is characterized by the forewing being of a dark golden

or purple brown color, with silvery-white or yellowish, shining, marginal spots. The second group has the forewing grayish-fuscous to brown or dark brown, with numerous oblique costal striæ, mostly white, rarely yellowish and without any metallic lustre. The species comprising this group resemble each other very much, are closely related and difficult to distinguish. The principal characters to be relied upon are the markings of the labial palpi, coloration of the head, the dark ciliary lines, the plical spots and last but not least, the food plant.

The following characters are common to all of the last group: Maxillary palpi white, sometimes slightly dusted with fuscous externally. Antennæ fuscous or brown above, indistinctly annulate with and beneath paler. Costal striæ rarely definite in number, generally ill defined, obscure and directed obliquely backward in basal half of wing, the outer striæ distinct, more or less perpendicular to the costal margin, the last stria as a rule forms a curved line extending through both the costal and dorsal cilia; immediately behind this line and in the apex of the wing is a dark blackish spot. Generally speaking the interstrial spaces are darker than the color of the wing. In the fold are two spots or patches—plical spots—rarely absent; the first of these is at one-fourth, the second about the middle, these spots vary in size and form, but appear to be fairly constant for each species. That part of the wing below the fold—subplical space—is in almost all the species, more or less mixed with white; basal part generally white. In the cilia, commencing about what would correspond to the tornus, are three darker lines, the first about the middle, the second nearer and the third on the free ciliary margin; this last line either extends entirely around the apex, or it coalesces below the apex of the wing, with the second line, and in this case the cilia are white on their free margin around the apex; generally there is a short fragmentary line below the apex and between the first and second line. Anterior and middle legs dark blackish-fuscous; femora spotted with white; end of tibiæ white; tarsi white, joints fuscous at apex; hind legs whitish, tarsal joints darker at the apex. Anal bush in the male generally a sordid yellow.

Generally the larva at first forms a nepticula like tract, which widens into a blotch-mine. When full grown it leaves the mine and forms a cocoon under the turned over edge of the leaf. According

to Chambers *O. inusitatumella* Ch. proves an exception to this rule, as the larva pupates in the mine. The pupal case is projected from the cocoon during the emergence of the imago. The latter in repose, like *Gracilaria, Coriscium*, sits with the anterior part of the body elevated.

Only two of the European species occur in North America—*O. guttea* and *anglicella*. Of other European species, of which authentic specimens had been placed at my disposal by the National Museum, none correspond with species herein described.

SYNOPTIC TABLE OF SPECIES.

Forewings with lustrous, white or yellow marginal spots.....1.
Forewings with numerous costal striæ, never lustrous.....4.

1. Four or more costal spots.....2.
   With two costal spots.....**boreasella.**
2. With entire fascia.....3.
   Without such a fascia.....**guttea.**
3. With five costal spots; cilia not tipped with dark brown around apex. **preciosella.**
   With six costal spots; cilia tipped with dark brown.....**kalmiella.**
4. Cilia around the apex not tipped with blackish scales.....5.
   With blackish scales.....9.
5. Third joint of palpi conspicuously banded with dark fuscous.....6.
   Third joint of labial palpi at most spotted with fuscous.....7.
6. Larger, dorsal margin of forewing with base and a spot behind the anal angle blackish.....**dubitella.**
   Smaller, without these characters.....**eratægifoliella.**
7. Costal striæ equal and equidistant.....**melanotella.**
   Outer costal striæ more strongly marked, conspicuous.....8.
8. With curved dorsal line before the apex.....**conspicuella.**
   Without such a line.....**arbitrella.**
9. Third joint of palpi conspicuously banded with dark fuscous.....10.
   Third joint of palpi white, or inconspicuously spotted with fuscous.....15.
10. Costal cilia not tipped with dark scales before the apex.....**anglicella.**
    Without that character.....11.
11. Ground color of entire forewing uniform.....**prunivorella.**
    Subplical space of forewing intermixed with white.....12.
12. Plical spots not attaining the dorsal margin.....**quadripunctella.**
    Plical spots large, attaining the dorsal margin.....13.
13. Costal striæ of at least moderate length.....**vicinella.**
    Costal striæ very short, almost reduced to spots.....**strobivorella.**
15. Fifth costal stria, from the apex, extends to dorsal margin. **arbutifoliella.**
    Without such character.....**obliterella.**

O. boreasella Clem.—"Forewings dark fuscous, with two white costal spots, one exterior to the middle of the costa, and the other midway between the first and the apex of the wing; and with two white dorsal spots, one a little interior to the first costal spot, and the other with some scattered white scales opposite the second costal spot. Cilia dark fuscous, with a white patch behind the second dorsal spot, and apparently a few white scales on the costa behind the tip. The apical spot is not distinct if present, the apex being nearly denuded of cilia and scales."

The above is Dr. Clemens' description of this species. Type in the Academy of Natural Sciences, Philadelphia. In poor condition when described. Head, abdomen and wings of one side wanting. Although the head is wanting and the neuration of the wing differs somewhat from the normal form, according to Clemens, I nevertheless believe it to be a true *Ornix*. There should be no difficulty to identify the species if found.

O. guttea Hw.—Palpi whitish. Head ochreous, face paler. Antennæ brown, faintly annulate with and paler beneath. Forewings fuscous brown, with a purplish lustre; four or five costal and two dorsal spots, first costal spot at one-fourth, second spot just before the middle, third nearly at three-fourths, the fourth spot just before the apex is sometimes duplicated; dorsal spots triangular, somewhat oblique at two-fifths and three-fifths respectively. Cilia fuscous, with three darker lines, traversed by an indistinct pale line below the apex and another corresponding to the second dorsal spot. Hindwings fuscous, cilia concolorous. Legs fuscous, femora and tibiæ spotted with white; tarsi whitish, joints brown at the apex. Thorax and abdomen fuscous brown. Expanse 10–12.5 mm.; .4–.5 inch.

This rather common European species occurs in our fauna. Two specimens in my collection, collected by and received from Mr. Albert Shaw, Hampton, N. H., entirely correspond with an authentic specimen of this species in the National Museum collection. In the specimens before me the last costal spot is very small, confined to the cilia and might readily be overlooked. The larva, according to Meyrick, is yellowish, dorsal line dark green or reddish. Head dark brown. It lives in folded leaves of apple.

Var. **solitariella** Pl. IV, fig. 1.

A specimen in the National Museum collection presents the following differences from the typical form:

Head grayish-yellow, intermixed with dark fuscous. Forewings with two very conspicuous costal spots before the apex, perpendicular to the margin and which nearly reach the dorsal margin. Three distinct dorsal spots, the first at less than one-fifth, nearly perpendicular to the margin and reaches to the middle of the wing. All other marginal spots correspond to *guttea*. Cilia more whitish

between the second and third dark line, a conspicuous white patch below the apex. Expanse 13.5 mm.; .54 inch.

Hab.—Washington, D. C.

The specimen, a male, was bred from apple.

O. kalmiella n. sp.—Pl. IV, fig. 3.—Palpi white. Face silvery white, intermixed with fuscous. Head fuscous, sparsely intermixed with white. Thorax and forewing golden brown, with considerable lustre, the latter with six costal and three dorsal, silvery white, obliquely placed spots, with pearly lustre; first costal spot at one-sixth, second at one-third, third about the middle and the fourth at two-thirds; these four spots are nearly equidistant, extend obliquely backward to or beyond the middle of the wing, except the third, which does not quite attain it. The second costal spot unites with the first dorsal and forming thus an obtusely angulated fascia. Just before the apex are two approximate costal spots, pointing obliquely forward. First dorsal spot at two-fifths and unites as before stated with the second costal spot. Second dorsal spot beyond the middle, third spot at three-fourths, the last two spots are rather short and somewhat oblique. A small round dot in apical part of wing. Cilia dark brown, a pale periapical line and a white patch below the apex, some silvery white scales at the base, corresponding to the second and third dorsal spots, forming a short line. Hindwings fuscous, cilia concolorous. Underside of body and legs fuscous, with considerable lustre; ventral segments edged with white scales posteriorly. Femora and tibiæ spotted with whitish. Tarsal joints at base and more or less beneath, whitish. Expanse 7.5–8.5 mm.; .3–.34 inch.

Hab.—Penna. (Hazleton); Conn. (East River).

Larva pale green, each segment with a transverse dark line, i with four transversely placed dots; it makes a pale, orange colored blotch-mine in upper side of leaf of *Kalmia angustifolia* (sheep-laurel); August, September. Imago the following May.

O. preciosella n. sp.—Pl. IV, fig. 2.—Palpi white, second and third joint with a white, dark fuscous band occupying the middle portion of each. Face silvery white, vertex dark brown, sparsely interspersed with white. Antennæ dark brown, finely annulate with white. Thorax dark brown, intermixed with silvery white scales. Forewings dark bronze-brown, with some lustre, markings pure silvery white; five costal spots, first close to the base, slightly oblique outwardly and crossing the fold; second at one-third, obliquely outward and forming with the first dorsal spot a curved fascia, widest on the dorsal margin; third spot about the middle, obliquely outward and not reaching the fold; fourth spot approximately midway between the preceding and following spot, perpendicular to the margin, triangular and reaches to middle of wing; the fifth spot is just before the apex, extends into the cilia and reaches nearly to the dorsal margin. Three dorsal spots, the first a little further from the base than the second costal spot; second and third approximate, two-thirds and three-fourths respectively, triangular, and midway between their free ends is the apex of the fourth costal spot. Basal half of cilia pale fuscous, margined externally by a dark fuscous line, outer half whitish, with a dark line half-way, free margin not tipped with

dark scales. Hindwings grayish-fuscous, cilia concolorous. Abdomen grayish-fuscous; anal bush grayish. Ventral segments edged with silvery gray. Legs dark fuscous, femora and tibiæ spotted with silvery white; tarsi whitish, joints dark fuscous at their apices. Expanse 8 mm.; .32 inch.

Hab.—Penna. (Hazleton).

Larva pale yellowish-green, with greenish dorsal line, i with four transversely placed spots. On *Vaccinium corymbosum* (swamp huckleberry); August and September. Imago April and May.

O. cratægifoliella Clem.—Palpi whitish, a spot on the second joint externally and a broad annulus of the third joint dark fuscous. Head grayish-white, tufts dark fuscous, mixed with gray, somewhat tinged with russet Forewings brown, with purple lustre; eight or nine costal striæ, outer six or seven distinct; fifth stria, from the apex, extends in a straight line, more or less distinct to the dorsal margin, bisecting a dark dash in middle of wing, another dark line on the disk before the middle. A heavy dark line in basal part of fold; plical spots elongate triangular, conspicuous, not reaching the dorsal margin; subplical space white, speckled with fuscous. Cilia around the apex not tipped with dark fuscous scales. Expanse 8–8.5 mm.; .32–.34 inch.

Hab.—Eastern States.

Type in fairly good condition, in the Academy of Natural Sciences, Philadelphia. Dr. Clemens' description, however, does not tally well with the former, as he describes the labial palpi as whitish, without mentioning the dark spot on the second or the annulus on the third joint.

Larva on *Cratægus tomentosa* (Hawthorn); *O. inusitatumella* Ch., which Chambers, misled by Clemens' description and also by the habit of the larva, which does not leave the mine to pupate, considered as distinct, is according to Mr. Busck, identical with *cratægifoliella*, the latter having seen the type. The food-plant being the same.

O. dubitella n. sp.—Pl. IV, fig. 4.—Very closely related to the preceding and from which it differs as follows: Absence of basal streak in the fold; plical spots less distinctly triangular, the outer one in one specimen consisting of two distinct lines or streaks. The subplical space more distinctly white towards the base; a dark fuscous or blackish spot on the extreme base of dorsal margin and another just behind the anal angle. Its very distinctly larger size. Expanse 10 mm.; .4 inch.

Hab.—Penna. (Hazleton).

Five specimens bred from a shrub, unknown to me. The larvæ were collected in August, 1899, the moths appearing the following May. The only note on the primary stages states "larva at first

makes a nepticula-like tract, later forms a cocoon under the turned over edge of the leaf, the form of the latter is ovate." Undoubtedly distinct.

O. conspicuella n. sp.—Pl. IV, fig. 5.—Palpi white; apex of second joint and the third joint at middle spotted with dark fuscous, less distinct within. Head whitish, tufts pale fuscous, intermixed with pale yellowish. Forewing a rich, deep brown, with purple lustre; markings very conspicuous; eight or nine costal striæ, outer four very distinct, becoming more approximate and effaced towards the base; an oblique dash at end of cell; first plical spot large, triangular, apex not quite reaching the dorsal margin, second plical spot large, subquadrate, including the dorsal margin and extending somewhat along the latter towards the base, another dark spot at end of subplical space, immediately beyond the latter is a curved dorsal streak, the end of which approximates the dark spot at end of wing. Cilia white around the apex, more intermixed with fuscous below, dark lines conspicuous; third coalescing with the second below apex. Expanse 8 mm.; .32 inch.

Hab.—Penna. (Hazleton).

Bred from *Betula nigra* (black birch); one specimen a female.

O. arbitrella n. sp.—Pl. IV, fig. 6.—Palpi white, third joint with a small blackish dot without and within. Head sordid white, tufts dark brown, shading into yellowish fuscous. Disc of thorax sordid white, sides and patagia dark brown, with feeble purplish lustre; seven or eight costal striæ, more distinct towards the apex, outer ones reaching to middle of wing; a white spot at end of cell; first plical spot broadly triangular, not reaching the dorsal margin; second plical spot large, reaches the dorsal margin and is ill defined externally; outer part of subplical space almost entirely dark fuscous, basal portion sprinkled with the same. Cilia whitish, basal portion around apex and a broad patch below the latter fuscous; free margin around apex not tipped with fuscous. Expanse 8–9 mm.; .32–36 inch.

Hab.—Penna. (Hazleton).

Two specimens in my collection were bred from *Vaccinium corymbosum* (swamp huckleberry). Differs from *conspicuella*, especially by the absence of the curved dorsal line, and from the following species by the more strongly marked costal striæ.

O. melanotella n. sp.—Pl. IV, fig. 7.—Palpi sordid white, third joint slightly spotted with fuscous externally. Head grayish-white, tufts fuscous, intermixed with gray. Thorax sordid white. Forewings brown, with a feeble, purple lustre; seven or eight slender costal striæ, approximately alike and equidistant, not reaching beyond one-third of wing breath; a well-marked spot at end of cell. Plical spots large, quadrate, the first smaller and not attaining the margin, the second very large and including the dorsal margin; remainder of subplical space speckled with fuscous. Expanse 7 mm.; .28 inch.

Hab.—Penna. (Hazleton).

The single specimen which serves as type of this species, was bred by the writer from thorn (*Cratægus*) in 1899. The fine, yet very distinct and nearly alike costal striæ are not seen in any other species known to me. Unfortunately the cilia are defective and I cannot discern whether they are tipped with dark fuscous or not, around the apex. It is therefore placed here tentatively, as it resembles more the two preceding species than any others.

O. anglicella Snt.—Palpi white, third joint broadly annulate with fuscous. Head yellowish-white, tufts brown. Thorax sordid white. Forewings dark gray, with numerous costal striæ, more distinct towards the apex: a white spot at end of cell, preceded by a fuscous spot. Plical spots moderately large, not attaining the dorsal margin; subplical space rather densely speckled with fuscous. Basal portion of cilia pale fuscous, remainder grayish-white, third line entire, except just before the apex where it is interrupted. Expanse 9-11 mm. (Meyrick); .36-.44 inch.

Hab.—Europe; New England States.

I cite this species here on the authority of Lord Walsingham.* A well authenticated European specimen of this species is before me, but have not seen one from within our own faunal limits.

The third ciliary line, although complete, extends to but not around the apex, thus distinguishing it from any others of our North American species. The larva lives on *Cratægus* (hawthorn), also occasionally, according to Meyrick, on *Fragaria* (strawberry).

O. prunivorella Ch.—Palpi white, third joint with a wide, dark fuscous band, which leaves only the base and extreme apex white. Head grayish fuscous, tufts darker. Thorax grayish fuscous. Forewings dark brown, intermixed, especially in basal half with grayish-purple; costal striæ rather obscure, more distinct on the costa, the outer four or five striæ extending nearly to the dorsal margin; interstrial spaces conspicuously darker; subplical space not intermixed with white and scarcely paler than rest of wing; plical spots almost obsolete, a patch of blackish, semi-erect scales about middle of dorsal margin. Expanse 8-9 mm.; .32-.36 inch.

Hab.—Middle and Northern States of Atlantic slope.

Larva in mine on underside of leaf of wild cherry and apple.

Two specimens in my collection, received a number of years ago from Miss Murtfeldt, agree with specimens bred by the writer from wild cherry, and have the dorsal patch of semi-erect scales, especially well developed; they do not, however, agree with any specimens of the genus which I have bred from apple, the latter belong-

* Trans. Am. Ent. Soc., 1882, p. 193.

ing to a different species altogether (*quadripunctella*), and do agree with a specimen in the National Museum collection, bearing the label "*O. prunivorella* Ch. *geminatella* Pack. bred from apple." The authenticity of this specimen is in doubt. I have not seen the type of *geminatella*. To judge by the description it is the same as *prunivarella* Ch. Nevertheless, I have serious doubts on this point, and while positive as to the identity of *prunivorella*, feel compelled to assign *geminatella* as a doubtful synonym of the former.

O. quadripunctella Clem.—Palpi sordid white, dusted with fuscous, second joint with dark apical spot externally, third joint broadly annulate with blackish fuscous. Face fuscous, mixed with gray, tufts dark drown, occiput and thorax grayish-white, latter speckled with fuscous. Forewings grayish-fuscous, with feeble purplish lustre and scattered white scales; seven or eight whitish costal striæ, approximately equidistant and increasing in length and distinctness towards the apex, where they almost reach the dorsal margin; apical spot well marked; plical spots in form of a subtriangular dash, extending but little into the subplical space, latter rather conspicuously white, with scattered fuscous specks. Cilia whitish, basal part and below the apex fuscous; three entire fuscous lines. Expanse 8.5-9.5 mm.; .34-.38 inch.

Hab.—Eastern States.

I entertain not the least doubt that this is the species of which Dr. Clemens described the larva and food-plant only. The former is pale yellowish, head and first segment each with a transverse row of black dots. I have bred specimens from *Pyrus arbutifolia* (choke berry), which is closely allied to and generally mistaken for *Amelanchier canadensis*. I have also bred it from apple. A specimen from the National Museum collection and referred to under *A. prunivarella* belongs here.

A specimen received from the National Museum collection, bred from quince (*Cydania vulgaris*), while scarcely distinguishable from the species under consideration, I feel restrained to consider at least as a variety, which eventually may prove to be specific.

Var. **albifaciella.**

Differs from typical specimens by the grayish-white head, face silvery white, tufts light yellowish fuscous. The larva also, according to a note on the label, differs "Larva differs from that on wild cherry, no black spots on thorax or head." This latter observation alone, if correct, would prove it a genuine species.

O. vicinella n. sp.—Pl. IV, fig. 8.—Labial palpi white, third joint with a wide blackish band, which leaves the basal third, extreme apex and upper edge of joint free, second joint with a small, but distinct dot near the apex, within and without. Head gray, strongly intermixed with brown on the vertex. Thorax grayish-fuscous; sides darker. Forewings dark brown, with purple lustre; eight or nine whitish costal striæ, not very evident, nearly equidistant and not reaching beyond middle of wing, the white being distinct only on and closely to the costa, where they are rather wide and subtriangular; ground color between the striæ of a decidedly darker brown; a white spot at end of cell; plical spots large but not sharply defined, the first not quite, the second fully, attaining the margin; remainder of subplical space more or less speckled with fuscous, so that the white is very little in evidence. Cilia with three entire lines, basal part fuscous, remainder whitish; a rather bright, white spot at the base of the cilia opposite the space between the third and fourth costal striæ (counting from the apex). Expanse 7 mm.; .28 inch.

Hab.—Penna. (Hazleton).

A small form. A single specimen, female, was bred by the writer from *Betula flava* (yellow birch). An obscure dark species, the white color being scarcely noticeable.

O. strobivorella n. sp.—Palpi yellowish-white, apex of second joint and an ill-defined band of third fuscous. Face grayish-fuscous, tufts a rich brown, occiput and thorax creamy white. Forewings grayish-brown; seven or eight costal striæ, very short, being scarcely more, especially towards the apex, then costal spots; a white spot at end of cell. Plical spots velvety black, very conspicuous, first not reaching the dorsal margin, second spot oval, and attains the margin, remaining part of subplical space finely speckled with fuscous. Cilia fuscous. Expanse 10 mm.; .4 inch.

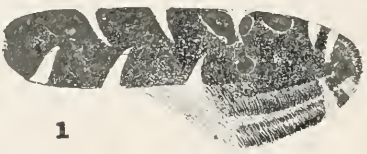
Hab.—Penna. (Hazleton).

A single male specimen, not in very good condition, bred from *Sorbus* (mountain ash). The larva forms a cone similar to *Gracilaria*. The cilia are defective, but what is left leaves scarcely a doubt that the three lines are entire.

O. arbutifoliella n. sp.—Pl. IV, fig. 9.—Palpi white, apex of second joint and a rather large spot on the third, externally, dark fuscous. Head white, tufts pale fuscous. Thorax white. Forewings gray along middle of wing, dark brown between the costal striæ; marking conspicuous, white; six or seven distinct costal striæ, inner ones very oblique, fourth and fifth striæ (from the apex) remote from each other, the latter extends as an undulating line towards the dorsal margin, which it attains at the tornus. Plical spots sharply defined, first spot elongate and reaching half-way to dorsal margin, second spot elongate-triangular, extending obliquely backward to within the dorsal margin; subplical space conspicuously white, with scattered fuscous dots. Cilia white, three entire dark lines. Expanse 9.–10 mm.; .36–.4 inch.

Hab.—Penna. (Hazleton).

3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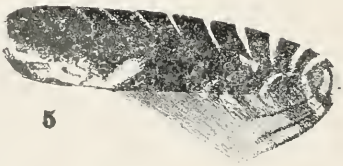
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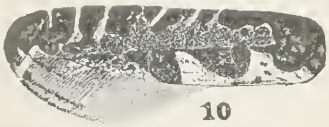
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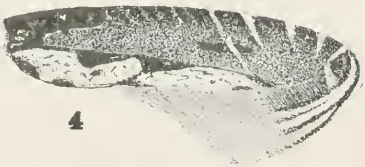
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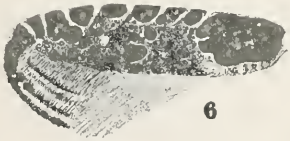
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Two specimens, bred from *Pyrus arbutifolia* (choke berry). A very distinct species. The white head and thorax, bright white markings and subplical space and the peculiar undulating fifth costal stria give it a characteristic appearance.

O. obliterella n. sp.—Pl. IV, fig. 10.—Palpi white, apex of second joint and a spot more or less distinct, on the third externally, fuscous. Head yellowish-white, tufts intermixed with fuscous. Thorax white, edged with fuscous anteriorly. Forewings purple-brown, markings white, distinct; five or six costal striæ, fourth and fifth (from the apex) remote, more approximate towards the apex, ground color not markedly darker between the striæ; a few scattered whitish dots. Plical spots large, first spot irregularly triangular, not quite reaching the dorsal margin, second spot trapezoidal and attaining the margin, some scattered white spots beyond the second plical; anal angle white. Cilia with three entire, darker lines, whitish; basal portion and below the apex darker. Expanse 8–6 mm.; .32–.36 inch.

Hab.—Penna. (Hazleton).

Bred from *Betula nigra* (black birch). Very distinct; the fourth and fifth costal striæ are more widely separated, resembling thus *O. arbutifoliella*, from which it is readily distinguished by the fifth stria not prolonged to the dorsal margin, the larger plical spots and the general darker color of the insect. I have no notes about the larva.

LIST OF SPECIES.

1. *Ornix boreasella* Clem.
2. " *guttea* Tr. var. *solitariella*.
3. " *preciosella* n. sp.
4. " *kalmiella* n. sp.
5. " *cratægifoliella Clem.*
6. " *dubitella* n. sp.
7. " *conspicuella* n. sp.
8. " *arbitrella* n. sp.
9. " *melanotella* n. sp.
10. " *anglicella* Stt.
11. *Ornix prunivorella* Ch.
12. " *quadripunctella* Clem.
13. " *vicinella* n. sp.
14. " *strobivorella* n. sp.
15. " *arbutifoliella* n. sp.
16. " *obliterella* n. sp.

UNRECOGNIZED SPECIES.

1. *Ornyx festinella* Clem.
2. " *trepidella* Clem.

EXPLANATION OF PLATE IV.

1. Forewing of *Ornyx guttea* var. *solitariella*.
2. " " " *preciosella*.
3. " " " *kalmiella*.
4. " " " *dubitella*.
5. " " " *conspicuella*.
6. " " " *arbitrella*.
7. " " " *melanotella*.
8. " " " *vicinella*.
9. " " " *arbutifoliella*.
10. " " " *obliterella*.

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A Monograph of the North American Psychodidæ, Including Ten New Species and an Aquatic Psychodid from Florida.

BY LEONARD HASEMEN, COLUMBIA, MISSOURI.

(Presented as a Thesis in Zoology for the Degree of Master of Arts, Indiana University.)

(Plates V–VIII.)

In preparing this paper the writer has attempted to give as accurate and as complete an account of our present knowledge of the mature and immature stages of the North American members of this family as possible. He has met with some little disappointment, however, in being unable to get specimens of several of the named species. It has been impossible for him to leave his work and visit the various collections, and the fragility of the flies has caused some little hesitancy in the loaning of specimens. For the species which he has unfortunately not been able to examine the original description of the type has been used whenever possible. Any minor detail errors that may be present in these type descriptions or errors in the generical location of these species are largely beyond his control. It does not seem at all probable, however, that there has not been more than a single species of *Pericoma* taken in the East, and as Kincaid once suggested, it is quite likely that some of these Psychodæ are really Pericomæ, but from the type description the writer is unable to say definitely. A species from Cuba by Williston and one from Guatemala by Coquillett, together with ten new species, have been included. Notes on Professor Kellogg's aquatic larvæ and pupæ and the life history of a new species from Florida have also been given.

The Psychodidæ have been very appropriately called "moth flies" from the resemblance which they bear to tiny moths. In most species the wings are broad and held roof-like in repose, which, together with the hairy vestiture of the body and wings, gives the flies the moth-like appearance. They are very small, the wings of the largest not exceeding about 4 mm. in length, so that they are seldom taken, except by careful collectors. They shun the sunshine and are most readily found upon shaded windows, upon the trunks

of trees, and in the overhanging foliage of trees and shrubs, bordering streams. They are very readily attracted to lights, and the writer finds this to be the most successful way of collecting them.

The venation of the wings probably represents the most generalized type in the Diptera, although there is good reason perhaps for placing the Tupulidæ at the foot of the scale. The immature stages of the Psychodidæ bear several points in common with Tipulidæ and Culicidæ; while the adults of the genus *Flebotomus* have the blood-sucking habit of the mosquitoes.

Excepting *Psychoda alternata* Say, which was first described in 1824, and *Psychoda degenera* Walker,* the type descriptions of which the writer has not seen, the work of collecting and describing the North American Psychodids was not taken up until the early 90's. A number of the European Psychodids were described during the earlier part of the last century; some of the bibliography cited by Eaton dating back to 1804, while the genus *Psychoda* dates back to 1796, when it was erected by Latreille.†

The European Psychodidæ have been grouped in two rather distinct divisions; the subfamily Phlebotominæ and the three genera *Pericoma*, *Psychoda* and *Ulomyia*. Four genera are included in the subfamily Phlebotominæ, classed in two series.

The first series includes the two genera *Nemopalpus* Macquart and *Phlebotomus* Rondani. The antennæ are 16-jointed. The proboscis is prolonged and the palpi are elongate, with a flexible terminal joint. The radial sector is 3-branched, and the third anal vein in *Phlebotomus* is wanting or hardly distinguishable from the anal furrow; while in *Nemopalpus* it is short and descends to the margin of the wing not far from the anal cross-vein.

The second series includes the two genera *Sycorax* and *Trichomyia* Haliday, in which the antennæ are 15-jointed. The proboscis is not prolonged and the palpi are short, rather stout, with a firm terminal joint. The radial sector is reduced to a single forked vein. The third anal vein is short in *Sycorax* as in *Nemopalpus*, but in *Trichomyia* it is long. In *Sycorax* minute, rounded prominences, hardly distinguishable, replace the ovipositor and subgenital plate; while in *Trichomyia* the valves are short, broad, suboval, laminæ, and the plate minute, subtriangular and subobtuse.

* Walker, List, etc., I, 33.—Hudson Bay Territ.

† Osten Sachen, C. R., Diptera of North America, Smithsonian Inst., 1878.

The three genera, *Pericoma*, *Psychoda* and *Ulomyia*, all have 4-jointed palpi; 3-branched radial sector, forked cubitus; three anal veins and with a maximum number of sixteen joints in the antennæ. Some of the American species have seventeen joints.

Ulomyia is distinguished from *Pericoma* and *Psychoda* by the wings having a median upwardly bellowing sinus in the males. *Pericoma* and *Psychoda* are not so sharply defined. Eaton* characterizes the old genus *Psychoda* as follows:

"Male antennæ 14- to 16-jointed, with nodose flagellum composed of full sized joints as far as the thirteenth joint of the antenna, followed by one, two or three diminutive joints and furnished with hair inserted upon the symmetrical or subsymmetrical nodes in verticles consisting of a series of eleven long haired verticles closely moniliform, the eleventh including the diminutive joint or joints, wings ovate lanceolate, acute at the end of the median vein; subcosta very short and rudimentary, ending in the radius and not linked to the costa."

Since the European species of Psychodidæ are quite numerous the Rev. Eaton† recently began distributing them in smaller genera. The generic redistribution has not been completed, but the following six genera have been distinguished in the old genus *Psychoda: Philosepedon*, *Threticus*, *Logima*, *Telmatoscopus*, *Xenapates* and *Clytocerus*. When it comes to distributing our species in the smaller genera, as suggested by Eaton, it will evidently be necessary to erect some new genera peculiar to North America. Dealing with the North American species the writer thinks it would be best for the present to retain the two old genera *Psychoda* and *Pericoma*.

Six of the new species described in this paper possess the characters quoted above for *Psychoda* and have been placed in that genus. The three placed in the genus *Pericoma* have broader wings, rounded at the apex between the simple branch of the radial sector and the median vein. *Sycorax lanceolata* Kin. is a *Trichomyia;* the third anal vein, ovipositor and ventral plate are not reduced as in *Sycorax*, and the antennæ in *Trichomyia* are 15-jointed as in *Sycorax*, according to Eaton. In the collection received from Professor Snow the writer finds a new species of *Trichomyia* taken in Arizona. The 39 species included in this paper from North America and Cuba

* Eaton, Ent. Mo. Mag. xl, p. 57.

† Eaton, Ent. Mo. Mag. xl, p. 55.

are generically distributed as follows: *Psychoda*, 22; *Pericoma*, 13; *Trichomyia*, 2; *Flebotomus*, 2. This does not include *Ps. degenera* Walker.

In the paper recently mentioned Eaton maintains that the basis upon which the inferior pair of genital appendages of the male are borne, is in reality the anal segment, which dorsally is abbreviated, sometimes to a hair-like loop, to make room for the opposed pair of superior appendages and the intromittent parts. That the homologue in the female is termed the subgenital plate. And that the edge of the basis has been mistaken by several entomologists for a basal joint of the inferior appendages viewed sideways; but that a 2 jointed condition of the inferior appendages is unknown in Psychodidæ.

The writer's observations agree with Eaton's statement concerning the single jointed condition of the inferior genital appendages of the male. Some species bear a number of bristling, hair-like tenticles at the tip of the appendages, while others have a single, strong, clavate tenticle, which has been mistaken by Banks and Kincaid for a terminal segment. The shape of the basis bearing the inferior appendages shows very plainly in some species that it is nothing other than the reduced anal segment and not fused basal segments of the inferior appendages, as erroneously described by Banks and Kincaid.

In the descriptions of North American species there has apparently been no mention made of the intromittent organ and the basis of the inferior male appendages, both of which are certainly structures of importance. In two of the new species the thirteenth segment of the antennæ bears a terminal spike with two or three slight enlargements. Eaton considers these enlargements as distinct segments, but the writer is unable to detect any segmentation whatever. In the descriptions of the new species, the following enumeration of the wing veins has been adopted: 0, subcosta; 1, radius; 2, 3, 4, branches of radial sector; 5, median vein; 6, 7, branches of forked cubitus; 8, 9, 10, anal veins; vein 4 being absent in Trichomyiæ. The artificial key for *Pericoma* is original, while that for *Psychoda* includes the list of eastern *Psychoda* by Banks. The four plates included contain original camera lucida drawings, and the figures of the life history material were drawn largely from living specimens.

PERICOMA.

1. Wings light ..... 2.
   Wings mottled ..... 3.
   Wings dark ..... 8.
2. Wings uniform gray; fringe darker; ventral plate trilobed ..... **triloba.**
   Wings uniform gray, except white band across middle; fringe with basal third gray, remainder white; ventral plate bilobed ..... **tridactila.**
3. Wings with brown and black, most noticeable at furcations and tips of veins...4.
   Wings banded with black; frings dark brown to black, with white or black patches at tip of veins ..... 6.
4. Wings with dark brown at furcations and tip of wings ..... **californica.**
   Wings with black at furcations and tip of veins ..... 5.
5. Fringe gray, with white at apex; antennæ one-half as long as breadth of wing; 16-jointed ..... **sitchana.**
   White most pronounced toward base and apex of wing, where it forms small, irregular blotches; fringe black, except band of white from tip of vein 3 to vein 7, and a blotch of same color between veins 8-9; antennæ 17-jointed ..... **bipunctata.**
6. Wings with but a single irregular transverse band of black; bordered within with two white patches which often run together, forming a band; apex of veins black ..... **olympia.**
   Wings with two or more rather distinct transverse bands of black; apex of veins white ..... 7.
7. Wings with two curved rows of black tufts across middle; white between these; largely black beyond second, while basal portion is black and white ..... **furcata.**
   Wings with six more or less distinct transverse bands of black; one at furcation, two between it and base of wing, and two between it and the outer band, which extends from between veins 1-2 to between veins 8-9; basal patch of white on each margin, and on costal a second patch between the basal one and tip of first vein ..... **trialbawhorla.**
8. Wings uniform grayish-black; scales on base of wings below ..... 9.
   Wings banded or blotched with white ..... 10.
9. Scales extending out to furcations, densely clothing the base of wing; from furcations to tip of wings clothed with ordinary hair below; antennæ 16-jointed; furcations even ..... **scala.**
   Few scattered brown scales on the lower surface of wings at base, followed by flat hairs of same color to tip of wings; antennæ 17-jointed; anterior furcation nearer base ..... **longiplata.**
10. Wings deep black, except broad transverse white band near base and outwardly curved row of white patches beyond middle; fringe with alternate white and black patches ..... **variegata.**
    Wings dark brown, except white patch at middle and at apex; fringe on posterior margin dark brown and white; white, alternate with brown at tips of veins ..... **truncata.**
    Wings brown, with large basal blotch of white and a transverse band from the tip of veins 3-7; small patch at tip of veins 2-3-4; fringe brown, variegated with white; basal joint of antenna in male comprising about one-fourth its length ..... **ocellaris** var. **americana.**

Pericoma triloba Kincaid.

Pericoma triloba Kincaid, Entomological News, X, p. 33 (1899).

"*Female.*—Body brown, densely clothed with gray hair. Wings broadly ovate, not quite twice as long as broad, apex distinctly pointed, exactly at end of first simple nervure, clothed with gray hair upon the veins; fringe dark gray; length of wing 3 mm.; posterior furcation much nearer the base of the wing than the anterior one. Legs brown, clothed with gray hair and scales. Antennæ one-half as long as the width of the wing, not much longer than the maxillary palpi; 17-jointed; joint 1 moderately large; joint 2 extremely large, subglobose; toward apex clothed with scattered whorls of long gray hair; joint 17 minute. Ventral plate broad at base, emarginate laterally and terminating in three distinct lobes; ovipositor yellow, slightly curved.

"*Male.*—Genitalia inconspicuous, very hairy. Inferior appendages 2-jointed; joint 1 large and stout; joint 2 short, cylindrical, curving toward the apex which is broadly and obtusely truncate. Superior appendages 1-jointed, short, straight, tapering from the base to an acute point."

Hab.—Sitka, Washington. March 12th to June 1st.

Pericoma tridactila Kincaid.

Pericoma tridactila Kincaid, Entomological News, X, p. 32 (1899).

"*Female.*—Body light brown, densely clothed with gray hair. Wings ovate, one and one-half times as long as broad, apex moderately acute, clothed over the whole surface with gray hair, except an irregular band of white across the middle; fringe with basal third gray, remainder white, as long as the width of three cells; length of wing 2.5 mm. Legs light brown, clothed with gray hair and scales. Antennæ as long as the width of the wing, 16-jointed, with dense whorls of gray hair upon the nodes; joints 1–2 not larger than succeeding one; joints 3–15 globular, separated by slender pedicles, which are slightly longer than the length of the nodes; joints 14–16 minute, closely apposed. Ventral plate longer than broad, sides not emarginate, narrowing strongly toward the apex, which is bilobate.

"*Male.*—Genitalia conspicuous, clothed with gray hair. Inferior appendages elongate, 2-jointed; basal joints stout, cylindrical, fused in the median line; second joint as long as first, straight, cylindrical, tapering to a rounded apex and bearing at the tip three divergent, slender, clavate processes, which are almost as long as the second joint itself. Superior appendages half as long as inferior, 2-jointed; joint 1 cylindrical, stout; joint 2 as long as first, slender, tapering to an acute point."

Hab.—Seattle, Washington. March 24th to June 15th.

Pericoma californica Kincaid.

Pericoma californica Kincaid, Entomological News, XII, p. 195 (1901); Kellogg, Entomological News, XII, p. 46 (1901), immature stages.

"*Females.*—Length 2 mm. Body brown, clothed with long gray hair. Wings ovate, twice as long as broad, apex bluntly rounded and terminating close to the tip of the second simple vein; vestiture mottled with dark brown and white hair; patches of erect dark brown hair upon the bifurcations and at the apex of the veins; patch of white hair entad to the posterior bifurcation and another ectad to the anterior bifurcation; fringe gray; posterior bifurcation closer to

breadth of the wing; 17-jointed; basal joint cylindrical, slightly longer than broad; second joint relatively large, globular; third to seventeenth joint nearly uniform in size, cylindrical, slightly narrowed at each end. Ventral plate squarish at base, finely ciliate, broadly and deeply emarginate at apex, the terminal lobes elongate, with bluntly rounded tips. Ovipositor long and narrow, nearly straight.

"*Male.*—Genitalia conspicuous, clothed with gray hair. Inferior appendages elongate, 2-jointed; basal joint stout, twice as long as broad; second joint swollen at base, tapering to apex, which is rounded and bears on its dorsal surface a group of six or more stout, flattened setæ. Superior appendages as long as inferior, 2-jointed; basal joint stout, cylindrical; second joint slender, slightly enlarged basally, curved gently upward."

Hab.—Congress Springs, California. Reared from aquatic larvæ taken by Prof. V. L. Kellogg.

Pericoma sitchana Kincaid.

Pericoma sitchana Kincaid, Entomological News, X, p. 33 (1899).

"*Male.*—Body black, clothed with gray hair. Legs black, clothed with gray hair and scales. Wings ovate, broadly rounded at the tip, the first simple nervure terminating just before the apex; bifurcations equidistant from the base of the wing; hair upon the veins mixed black and white, the black being most pronounced at the apices of the veins and at the bifurcations; length of wing 2.5 mm.; fringe gray, with a patch of white at the apex. Antennæ one-half as long as the width of the wing, 16-jointed; joint 1 cylindrical; joint 2 large, globular; joints 3–16 globular, separated by very short pedicles, the nodes sparsely clothed with gray hair. Genitalia not conspicuous, black, clothed with gray hair."

Hab.—Sitka, Alaska. July 12th.

Pericoma bipunctata Kincaid.

Pericoma bipunctata Kincaid, Entomological News, X, p. 34 (1899).

"*Female.*—Body brown, clothed with white hair. Legs brown, clothed with white hair, some of the latter being long. Wings broadly rounded at the tip, about twice as long as broad, clothed upon the veins with white and black hair, the black most pronounced at the apices of the veins and upon the bifurcations, the white most evident near the base and toward the apex, where there are small, irregular patches of this color; fringe black, except a spot extending from the apex of the third longitudinal vein to the end of the seventh, and a small patch between the eighth and ninth vein, which are white; bifurcations equidistant from the base of the wing; antennæ 17-jointed; joint 1 rather large, cylindrical; joint 2 broader than 1, globular; joints 3–17 fusiform, clothed with scattered white hairs; joints 3–4 bear dorsally a row of strong, erect, black setæ. Ventral plate squarely produced, slightly emarginate at apex.

"*Male.*—Genitalia conspicuous, black, clothed with white hair."

Hab.—Seattle, Washington; Santa Cruz Mts., California.

Pericoma olympia Kincaid.

Psychoda olympia Kincaid, Entomological News, VIII, p. 144 (1897); Kincaid, Entomological News, X, p. 31 (1899).

"Length 2 mm.—Body brown, densely clothed with dark gray hair. Legs brown, clothed with dark gray hair; a number of long white hairs scattered over

the tibiæ; tarsi with gray scales. Wings lanceolate, acutely pointed; length 3.5 mm.; fringe on anterior margin black, as long as the width of a cell, with a long tuft near base; on posterior margin gray, sometimes with a few black hairs, as long as the width of three cells; small patch of black hair at tip of each vein, an irregular band of black hair across wing, toward apex; immediately internal to this two patches of white hair which occasionally run together into a band; small patch of white hair at base of wing; region near base with mixed black and white hair; antennæ 16-jointed, dark, clothed with verticillate gray hairs upon the nodes, except first and second joints, which are covered with scales; first joint cylindrical; second joint round; joints 3–14 fusiform, produced into tapering pedicles; joints 15–16 small, without pedicles; length in female as long as width of wing with fringe; in male twice the breadth of wing; male genitalia not conspicuous; brown, with scattering gray hairs. Inferior appendages 2-jointed; first joint oblong, stout, united into a broad plate ventrally, which is produced posteriorly into a small, median, conical process; second joint slightly longer than first, obclavate, slightly curved, apex truncated and bearing a group of long stiff bristles. Superior appendages as long as inferior, 2-jointed; first joint oblong; second joint a little longer than first, slender, tapering to an acute point. Ventral plate of female as broad as long, terminating posteriorly in two finely pubescent lobes with a slight emargination between; anteriorly it is densely clothed with gray hair; ovipositor yellowish, inconspicuous, as long as ventral plate, almost straight."

Hab.—Olympia and Seattle, Washington, April and July.

Pericoma furcata Kincaid.

Pericoma furcata Kincaid, Entomological News, X, p. 34 (1899).

"*Female.*—Body brown, clothed with white hair, among which a few black hairs are scattered. Wing twice as long as broad, narrowly rounded at the apex, which is pointed between the simple veins; wings clothed with white and black hairs as follows: Two curved rows of prominent black tufts across the middle of the wing, between which the hair is principally white; the area between the outer row of black tufts and the apex of the wing principally with black hair; area between the inner row of black tufts and the base of wing with mixed black and white hair; fringe black, with white tufts at apices of all the veins; bifurcations equidistant from the base of the wing; length of wing 2.8 mm. Antennæ as long as the width of the wing, 16-jointed; joints 1–2 slightly larger than the succeeding ones; joints 3–16 swollen at base and bearing loose tufts of black hair. Legs with alternate annulations of black and white hair. Ventral plate dilated basally and strongly produced in the middle, the production bilobed and angularly emarginate at apex; ovipositor moderately long, almost straight."

Hab.—Pullman, Washington.

Pericoma trialbawhorla n. sp.

Body dark brown to black, quite densely clothed with light gray and black hair; white predominating on the anterior part of the thorax and at tip of abdomen; band of erect hairs above eyes, white; hair on lower surface of body darker. Legs dark brown, clothed with dark hairs and scales and banded with white at joints; base of tarsi white; tibiæ with median and terminal bands of white; hind tarsi almost entirely white. Length of antennæ 1.25 mm.; 17-

jointed; basal joints much stronger than the succeeding ones; first longer than broad; second globular; 3–15 with basal enlargements; joint 16 spherical; 16–17 closely joined; 17 with terminal spike; pedicles of 3–6 longest, one-third longer than their nodes; nodes 8, 12 and 17 with whorls of snow-white hair, while other nodes are clothed with whorls varying from gray to slaty-black; whorls 3–6 having a light cast in reflected light but not snowy, as 8, 12 and 17; segments 1–2 rather sparingly clothed with dark scales; nodes and pedicles dark brown. Length of wings 2–2.3 mm.; breadth .85–1 mm.; broadly rounded midway between the simple veins; bifurcations even, midway between the base and tip; wings densely clothed with white, black and brown hair; fringes rather heavy; posterior about one-fourth the breadth of wing, varying from brown to black, with a small patch of white at the tip of each vein, and a small white costal patch in front of the tip of the first vein; also a basal patch on costa and a more distinct basal patch on the posterior margin; tuft of long, bristling hairs of a yellowish cast commingled with the basal patch on costa; white patches occupying about as much of the fringe as the darker patches; wings transversely banded with black as follows: An interrupted but distinct band extending from midway between the tips of veins 1–2 to midway between 8–9; a less distinct parallel band extending from a point between the tips of veins 9–10 to the costal margin just in front of the tip of vein 1; midway between this and the bifurcations a still less distinct band; on a level with the bifurcations a very distinct band, and between this and the base of the wing two less distinct bands. These black bands are formed by erect tufts of flattened black hairs on the veins. Between these black bands the hair is largely white, giving the wings a distinct banded appearance. Male genitalia very short, hidden beneath the hairs of the posterior end of the abdomen. Ovipositor strong, a little longer than plate, acute at tip, slightly curved. Ventral plate longer than broad, tapering from an expanded base to tip, which has a shallow emargination; yellow at tip, black toward base; about one-fifth mm. long.

Readily distinguished by banded antennæ and wing markings.

Hab.—Columbia, Missouri. Five specimens taken on laboratory window and at light, September 18 to November 9, 1906.

Pericoma scala n. sp.

Body yellowish-brown, clothed with grayish-black hair, which to the unaided eye gives the insect a black appearance, but which, under magnification, appears lighter. Legs dark brown to black, clothed with dark hairs and scales; tarsi covered with light scales, which appear white in reflected light. Wings broadly rounded, apex about midway between simple nervures; length of wing 2.1 mm.; breadth .85 mm.; uniformly clothed with smoky gray hair; bifurcations even, 1 mm. from base of wing; hairs of posterior fringe longer and more erect than of anterior; length of former .35 mm., of latter .25 mm.; under surface of wings densely clothed with brownish-black scales from the base to the bifurcations, which give the base of the wings a conspicuous black appearance; beyond the scales is a narrow band of flat hairs, which give way to ordinary hairs distally. Antennæ 16-jointed; length 1.15 mm.; basal joint strong, cylindrical; second joint smaller than first, spherical; 3–15 with basal enlargements, about equal in length to the strong pedicles; 16 closely joined to 15, spherical, with short termi-

nal spike; segments 1–2 covered with scales and scattered hairs; 3–16 with short scales on the nodes inside the whorls of vertical hairs; whorls reaching beyond base of succeeding node, thus forming a broad cup around it. Sex indistinguishable, but from the shape of the posterior abdominal segments probably a female.

Hab.—Oak Creek Canon, Arizona. Single specimen from the Kansas University collection. Collected by Prof. F. H. Snow, in August.

Pericoma longiplata n. sp.

Body light brown, heavily clothed with grayish-brown hair; that upon the thorax almost white. Antennæ 17-jointed; basal segments strong and densely clothed with light scales and scattered bristling hair; length of first segment greater than its breadth; second spheroidal; segments 3–15 with basal enlargements, well clothed with whorls of light hair; 16 spherical; 17 closely joined to 16 with basal enlargement, and distal spike longer than the basal swelling; pedicles short and strong; length of antennæ .9 mm. Length of wing 2.1–2.2 mm.; breadth .75 mm.; narrower than in preceding species, but not acutely angular at tip; apex slightly nearer tip of median vein than simple branch of radial sector; above, wings very densely clothed with fine dark gray hair; below, base of veins with a few scattered brownish scales, followed by flat hairs of the same color, which extend to the tip of the wing; radial bifurcation slightly nearer base of wing than cubital, about .1 mm.; cubital furcation in the middle of the wing; fringes very heavy; posterior .5 mm. broad; anterior denser, but less erect than posterior. Legs about same color as body; hairs and scales covering them somewhat lighter than on body; middle and posterior tibiæ each with a row of long, erect spine-like hairs on its inner and outer surfaces; those on middle portion of the segments longest, and those of the outer row longer than those of the inner; femurs and tibiæ rather sparingly clothed with closely applied hairs and scattered scales: tarsi clothed with light scales. Ovipositor well developed, yellow, reddish toward the base; length .42 mm.; strong at base, but tapers quite rapidly to rather an acute point; slightly curved downward. Ventral plate longer than broad; broadly emarginate behind, slightly constricted in middle; base expanded and truncate; same color as ovipositor; three-fifths length of ovipositor.

Hab.—Oak Creek Canon, Arizona. Five females from the Kansas University collection. Collected by Prof. F. H. Snow, in August.

Pericoma variegata Kincaid.

Pericoma variegata Kincaid, Entomological News, X, p. 33 (1899).

"*Female.*—Body black, clothed with white hair, except a small patch of black hair near the base of the wing. Legs black, clothed with black and white hair. Wings rather acutely rounded at the tip, more than twice as long as broad; hair upon the veins deep black, except upon a broad transverse band near the base and an outwardly curved row of small patches just beyond the middle, which are white; fringe, both on anterior and posterior margin, with alternate patches of white and black hair; length of wing 2.8 mm. Antennæ black, as long as the width of the wing, 17-jointed; joints 1–3 stout, cylindrical, densely hairy; joints 4–17 small, fusiform, thinly clothed with long white hair. Ventral plate brown, shallowly emarginate at apex; ovipositor brown, rather long, almost straight."

Hab.—Seattle, Washington, May 8th.

Pericoma truncata Kincaid.

Pericoma truncata Kincaid, Entomological News, X, p. 35 (1899).

"*Female.*—Body brown, densely clothed with mixed white and dark brown hair. Wings ovate, broadly rounded at the tip, not quite twice as long as broad; hair upon the veins principally dark brown, with a rather large patch of white near the middle of the wing and its apex, fringe dark brown, on posterior margin as long as the width of three cells and with small patches of white hair alternating with the brown tufts at the apices of the veins; bifurcations of the veins equidistant from the base of the wing. Length of wing 4 mm. Legs brown, clothed with brown hair and scales, interspersed with a few longer white hairs. Antennæ black, not quite as long as the width of the wing, 17-jointed; joint 1 rather large, cylindrical; joint 2 large, globose; joints 3–16 fusiform, clothed with scattered hairs; joint 17 minute; ventral plate longer than broad, broadly truncate at the apex; ovipositor yellow, long and slender, strongly curved."

Hab.—Palo Alto, California.

Pericoma ocellaris Meigen var. **americana** Kincaid.

Pericoma ocellaris var. *americana* Kincaid, Entom. News, XII, p. 194 (1901).

"*Female.*—Length 2 mm. Body brown, clothed with brown hair, except upon the dorsal arc of the thorax, which bears a dense vestiture of long white hair. Wings ovate, more than twice as long as broad, apex bluntly rounded and terminating close behind the end of the first simple vein; anterior bifurcation a little nearer the base of the wing than the posterior one. Vestiture of wings brown, variegated with white as follows: A large patch near the base on the anterior margin, a sinuous band crossing the wing from the end of the third longitudinal vein to the end of the seventh, a small patch at the tips of the second, third and fourth longitudinal veins. Fringe brown, variegated with white as follows: A large patch near the base on the anterior margin, a small patch at tips of first to third longitudinal veins, a patch on the posterior margin extending from the tip of the fourth vein to the tip of the seventh, and a small patch at the end of the ninth vein. Legs clothed with brown hair and scales, with several annulations of white upon the tarsi. Antennæ a little longer than the width of the wing, 16-jointed; basal joint cylindrical, four times as long as thick; second joint large, globular; third joint much smaller than second, ovate; fourth to sixteenth joints slender, fusiform, gradually diminishing in size; the joints clothed with scattered hairs. Ventral plate shallowly emarginate at apex, terminating on each side in a well marked lobe. Ovipositor straight, acutely pointed.

"*Male.*—Antennæ differing from those of the female in that the basal joint is relatively much longer, forming about one-fourth the length of the entire organ, and the third joint, which is oval, bears near its apex an oval scar, from which arises a dense tuft of hair, the tuft being strongly bent in the middle, so as to assume a sinuous appearance. Genitalia conspicuous. Inferior appendages 2-jointed; basal joint stout, twice as long as broad; distal joint nearly twice as long as basal, slightly curved, tapering to apex, which bears a tuft of upwardly projecting setæ. Superior appendages not quite as long as inferior, 2-jointed; basal joint stout, cylindrical; distal joint nearly straight, slender, about equal in length to basal, tapering to a rather acute point."

Hab.—Maine.

PSYCHODA.

1. Wings black ..... 2.
   Wings mottled with white and black ..... 11.
   Wings gray or smoky gray ..... 12.
2. Wings with iridescent scales, hind tarsi only partly white ..... **nitida.**
   Wings without iridescent scales ..... 3.
3. Hind tarsi wholly pale yellowish or whitish ..... 4.
   Hind tarsi black or only partly pale ..... 8.
4. Two black patches on wings before middle ..... 5.
   No black patches ..... 7.
5. Wings with no white patches at tip of veins ..... **marginalis.**
   Wings with white at tip of veins ..... 6.
6. Wings over 3 mm., with small white, black and yellow patches of erect flat hairs at radial bifurcation and similar patches of black and white at cubital bifurcations ..... **snowii.**
   Wings less than 3 mm., without these patches of flat hair as above. **albipunctata.**
7. Length of wing more than 2 mm., white at tip ..... **albitarsus.**
   Less than 2 mm., without white patches ..... **horizontala.**
8. Hind tarsi wholly black, wings and fringe all black ..... 9.
   Hind tarsi with some white marks, wings and frings marked with pale ... 10.
9. Thorax white ..... **bicolor.**
   Thorax black ..... **nigra.**
10. Fringe on posterior margin blackish, abdomen with white hair, wings banded with pale, legs pale ..... **slossoni.**
    Fringe on posterior margiu more whitish, apical margin with distinct black dots, wings not plainly banded though with scattered white hair, legs black ..... **superba.**
11. Wings with alternate patches of black and white, antennæ shorter than breadth of wing, 15-jointed, distinct patches at tip of veins. **schizura.**
    Wings principally light grayish, with scattered patches of black, antennæ 13-jointed, equal breadth of wing, patches at apex of wing less distinct ..... **floridica.**
12. Wings uniform gray ..... 13.
    Wings very dark gray to smoky ..... 16.
    Wings marked with black ..... 17.
13. Wings at least 2 mm. long ..... 14.
    Smaller; wings less than 2 mm ..... 15.
14. Antennæ slender, slightly longer than width of wing, 15-jointed .. **cinerea.**
    Length of antennæ one and one-half times the width of wing; 16-jointed. **elegans.**
15. Fringe on hind margin rather short ..... **minuta.**
    Fringe on hind margin very long, one-half breadth of wing. **longifringa.**
16. Wings uniform smoky, without black patches at tip of veins. **uniformata.**
    Wings lighter, with black patches at apex of most of the veins. **nocturnale.**

17. Wings banded, with basal and marginal patches of black, also median band from costa to middle of wing, dots at ends of veins, base and tip of hind tarsi black.....**signata.**
Wings scarcely banded.....18.
18. Hind tarsi unmarked (yellow), dots at apex of veins, no basal black band nor marginal patches beyond the middle.....**alternata.**
Hind tarsi uniform dark brown, wings with band of black near base, and a black spot on each margin beyond the middle, and one or two apical dots.....**opposita.**
Legs yellowish-white, with creamy colored hair, wings with creamy colored hair, except for an S-shaped patch of black across the middle, fringe creamy colored, except black patch at terminals of the S....**sigma.**

Psychoda nitida Banks.

Psychoda nitida Banks, Canadian Entomologist, XXXIII, p. 275 (1901).

"Thorax in front densely clothed with long gray hair, behind at the base of the wings it is darker, often black. Abdomen black, with jet black hair. Legs black, with black hair; on the basal joints of all tarsi are some white scale-like hairs. Wings clothed with black, and some iridescent scales showing a bluish, greenish, or coppery hue, according to the light and position. Fringe black, white at tip of wing. Tip of veins usually show heavier patches of black hair or scales. Antennæ slender, moniliform, slightly longer than the width of the wing. Wings moderately broad, scarcely acute at tip, the fringe on the posterior margin being about one-fourth the width of the wing. Length of wing 2.6 mm."

Hab.—Washington, D. C.

Psychoda marginalis Banks.

Psychoda marginalis Banks, Canadian Entomologist, XXVI, p. 333 (1894); XXXIII, p. 275 (1901).

"Black, head and thorax with white hair, but not very dense; abdomen with black hair, and often a small patch of white hair each side at tip; wings thinly clothed with black and gray hair, and some scattered white ones near base, two prominent patches of erect black hair just beyond the middle of the wing; the fringe dark gray, except near the tip on each side, where it is whitish, giving the appearance of a white margin to a black wing; it is very long, on the posterior margin nearly as long as the breadth of the wing; legs dark, with gray hair. Antennæ slender, black, with whorls of gray hair, about as long as the width of the wing; wings narrow, acute at tip. The inferior pair of male appendages are long and slender; at first they are parallel, then they diverge and curve upward; they are clothed with fine black hair; the superior pair are very far apart at base, about two-thirds as long as the inferior pair, gradually tapering and but little curved toward each other. Length of wing 1.8–2 mm.

Hab.—Sea Cliff, N. Y.

Psychoda snowii n. sp.

Body light brown, densely clothed with smoky brown and white hairs; on thorax almost wholly white; on abdomen darker. Legs brownish, with white, black and brownish hairs and scales; tip of femurs and tibiæ white; base of tarsal segments white; fifth almost entirely white. Length of wings: female, 3.5 mm.; male, 3 mm.; breadth: female, 1.5 mm.; male, 1.4 mm.; wings ovate,

rather acutely angulated at tip of median vein; radial furcation slightly nearer tip than cubital, about two-thirds length of wing from tip in the male. Female wing rather densely clothed with black and dark brown, variegated with white and yellow hair; fringes appear lighter; anterior denser, but less erect than posterior; costa with a dense basal patch of brown; beyond this a large patch of black; tips of veins 1-2 with small patch of yellowish-white hairs and the fringe from tip of third vein to the apex of wing of the same color; tip of wing black; posterior fringe with small yellowish-white patches at tips of veins 6-7-8-9 and just behind the tip of vein 10; entad to the radial furcation is a patch of erect, bright yellow, flat hairs, bordered in front and behind with small patches of similar white hairs; behind the furcation on the anterior branch is a small snowy patch, followed by a small black patch, which is followed by a second yellow tuft, and this in turn is bordered behind by a second snowy tuft; behind the furcation on the posterior branch is a large tuft of black hair; ectad to the cubital furcation on the posterior branch is a small patch of white, bordered behind by black; there is a more or less distinct transverse band of white about on a line from tips of veins 1 and 9; white at base of veins much less distinct than in males. In the males the patches at tips of veins more distinct and snow white; transverse band of white less distinct; base of all the veins white; costa black at base, followed by large white patch; anterior fringe much darker than in females, which is also true of the whole wing vestiture. Antennæ 16-jointed, 2 mm. long; basal segments about equal; scales on first principally black, on second white; segments 3-16 with basal enlargements and long slender pedicles; pedicles about uniform in length, much longer than nodes; nodes and pedicles brownish-yellow; nodes with whorls of snow-white hair, which are more erect in the males, giving the antennæ a heavier appearance; terminal spike of sixteenth segment slightly constricted in the middle but expanded toward the apex, bearing very short light hairs. Ovipositor yellowish, .3 mm. long, almost straight. Ventral plate yellow; a third broader than long; breadth .2 mm.; broadly truncate at base, constricted toward the middle and slightly expanded toward apex, which is broadly emarginate. Inferior pair of male genitalia prominent; .5 mm. in length; expanded toward base; quite densely clothed with long, gray, knotted hair over half way to tip, where they are suddenly constricted; terminal constricted portion bearing ten or twelve strong, erect, flat tenticles; basis of inferior pair of genitalia strongly developed, broad at apex, with median projection, tapering toward base; shorter than the genitalia; superior pair strong, 2-jointed, about equal the length of inferior; basal segment quite strong; only sparingly clothed with hair; second segment tapering rapidly from slightly expanded base to acute tip, which is hooked downward. The side view of the genitalia shows how the basis can be mistaken for a basal segment of the inferior appendages. Intromittent organ strongly developed; .25 mm. long and broader than deep; club shaped, with an oval-shaped opening on the dorsal surface; depressed toward tip. The hair covering thorax, abdomen and male genitalia knotted; in some cases a single hair will have as many as three or four enlargements. The writer found knotted hair on none of his other specimens.

Hab.—Galveston, Texas. Three males and three females from the Kansas Univ. collection. Collected by Prof. F. H. Snow, in May.

Readily distinguished by large size; color patterns of wings; snow-white antennæ and knotted hair.

Psychoda albipunctata Williston.

Psychoda albipunctata Williston, Entomological News, IV, p. 113 (1893).

"Wings rather broad, clothed rather thinly with brownish and blackish hair; a tuft of blackish hair near each furcation; at the extremity of each vein, save the first, and last, a smaller, white one; a small white tuft also near the black one on the anterior furcation; the prefurca of the second vein with longer and yellowish hair. Abdomen in ground color, luteous and blackish, the hair abundant and erect, for the most part gray, or brownish-gray, with black intermixed. Hair of the thorax brownish-gray, abundant; antennæ yellow, elongate, longer than the abdomen; basal joints moderately thickened, the remaining joints slender, verticellate with white hairs. Legs brown, clothed with brownish hair and tomentum, with narrow annuli of white tomentum at tip of tibiæ and metatarsi; hind metatarsi ciliated; tarsi stout. Length 2.2 mm.; wings 2.2 mm."

Hab.—Havana, Cuba. Collection of National Museum.

Psychoda albitarsis Banks.

Psychoda albitarsis Banks, Canadian Entomologist, XXVII, p. 324 (1895); Banks, Canadian Entomologist, XXXIII, p. 275 (1901).

"Wings moderately broad, tip not very acute, clothed with blackish hair; some specimens show a patch of more dense hair on the middle near the costal margin; the fringe is black, except at the tip, where it is white; behind, the fringe is over four times as long as the width of a cell; head, thorax and abdomen densely clothed with black hair; legs with dense black hair, except the tarsi, which are white or pale yellow. Antennæ very short, pale, with whitish hair. Length of wing 2.4 mm.

"Differs from *P. nigra* by white apical fringe, and white tarsi and less pointed wings; from *P. marginalis* by larger size, white tarsi and black haired body."

Hab.—Ithaca, New York, June and July.

Psychoda horizontala n. sp.

Head, thorax and body deep black; clothed with dark gray and black hair; legs black, well clothed with gray and smoky hair; scales on tarsi light. Wings narrowly ovate, acutely angulated at tip of second simple nervure; veins and wing border dark brown to black, evenly but rather sparingly clothed with dark gray and smoky hair; fringes narrow and thin, posterior hardly one-fourth the breadth of wing; same color as the hair on veins. Anterior furcation in the middle of the wing, about one-eighth the length of wing nearer tip of wing than the posterior. Length of wing 1.3–1.6 mm.; width .45–.6 mm. Length of antennæ one and one-half the breadth of wing; 13-jointed; 1–2 stronger than the rest; first longer than the second; 3–13 with basal enlargements; their diameters less than the length of the slender pedicles; thirteenth with terminal spike, bearing three slight enlargements. Nodes and pedicles black, whorls light; basal segments sparingly clothed with light scales. Genitalia very prominent; basis of inferior pair of male genitalia broad behind, but tapers rapidly toward base; inferior appendages strong, club shaped, slightly enlarged at base, but tapering only slightly until near the tip, where it constricts rapidly to a rather acute tip; bearing a single strong clavate tenticle; about twice the length of the basis; length one-half the breadth of wing; superior pair about as long as inferior; 2-

jointed; basal segment slightly longer and stronger than terminal one, which is directed downward, clothed with scattered, short erect spinules; inferior pair spreading horizontally, clothed to very tips with long bristling hair. Intromittent organ small, spike-like.

Hab.—Columbia, Missouri. Two males taken on laboratory window November 8th.

Psychoda bicolor Banks.

Psychoda bicolor Banks, Canadian Entomologist, XXVI, p. 333 (1894); XXXIII, p. 275 (1901).

"Head and thorax yellowish-white, abdomen black, the former with white, the latter with black hair; wings with black hair; most dense toward base and on costa; fringe black and dark gray behind, where it is about three or four times as long as the width of a cell; legs black, with black hair; antennæ slender, slightly longer than breadth of wing, black, with whorls of dark gray hair; the wings are broader than usual, very oblique behind, and acute at tip. The inferior male appendages are 3-jointed, the basal joints nearly united, the second joint tapering and curved upward, about as long as the first joint, at tip with a short, recurved, pointed joint; superior appendages two-thirds as long; widely separated, curved doward, slender at tip. Length of wing 2.4 mm."

Hab.—Sea Cliff, N. Y.

Psychoda nigra Banks.

Psychoda nigra Banks, Canadian Entomologist, XXVI, p. 331 (1894): Canadian Entomologist, XXXIII, p. 275 (1901).

"Black, with dark brown on the thorax and long black hair on the abdomen, wings evenly and quite thickly covered with long black hair, and with a black fringe, which on the posterior margin is about five times as long as the width of a cell; legs black, with very long black hair on outside of the tibiæ at base. Antennæ slender and a trifle longer than the width of the wing, clothed with white and some black hair, giving them a grayish appearance; wings narrower than in *P. alternata*, and very acute at tip, the posterior margin near tip being almost concave. The ventral plate of the female is blackish, not much longer than broad, broadest at base, and barely emarginate at tip; ovipositor more than twice as long as plate and slightly curved. Length of wing 2.1 mm."

Hab.—Sea Cliff, N. Y.

Psychoda slossoni Williston.

Psychoda slossoni Williston, Entomological News, IV, p. 114 (1893); Banks, Canadian Entomologist, XXVII, p. 324 (1895); Canadian Entomologist, XXXIII, p. 275 (1901).

"Wings rather narrow, the upper surface clothed for the most part with rather long, black hair, with one or two poorly differentiated bands or spots of whitish hair; costa at the base with a large tuft of dense, long, black hair, beyond the tuft of hair becomes gradually shorter and somewhat intermixed with whitish; on the posterior margin the hair is dense and long, black, except between the termination of the sixth and seventh veins, and at the tip where it is white. Body black, not shining; abdomen and scutellum clothed with long white hair,

the dorsum of the thorax apparently with black and white hair; antennæ not longer than twice the greatest diameter of the head, slender, light yellow; the basal joints dilated, black, and densely clothed with black hair; the following joints elongate, slender, with a row of about six slender, successively longer, erect, straight, fine bristles on the upper margin. Legs yellowish, the tarsi blackish; tibiæ and tarsi, or at least the two anterior pairs, ciliate, with long black hair; that on the tibiæ on both sides distally; that on the tarsi chiefly on the basal joint and on the posterior and dorsal margin. Length 2.2 mm.; wings 2.75 mm."

Through the kindness of Professor Snow the writer has been permitted to examine Williston's type and will add the following notes: Wings rather broadly rounded at tip between two simple nervures; length 3.1 mm.; breadth 1.25 mm. Hair on wings principally dark brown, with reflected light; anterior fringe light; breadth .5 mm.; posterior fringe broader, dark, except light patches between first and second anal veins, and at tip of wing, and a light brown patch at tip of third anal vein; upper surface of wing with a rather distinct, narrow, transverse band of white, midway between furcations and tip of wing, bordered on its inner margin with a narrow band of black; at the furcations a broader but less distinct band, consisting of scattered white hair; under surface of wings principally dark brown, with some scattered white hair; bifurcations about even, near middle of wing.

One wing and part of the body is all that is left of the specimen. Should probably be *Pericoma*.

Hab.—Watkin's Glen, N. Y.

Psychoda superba Banks.

Psychoda superba Banks, Canadian Entomologist, XXVI, p. 332 (1894); XXXIII, p. 275 (1901); Kincaid, Entomological News, XII, p. 193 (1901).

"Black, with thorax clothed in the middle with black hair, and on the sides with snow-white hair, in some cases it appears to be all white haired; the abdomen with long, dense, black hair; the wings with blackish hair and patches of erect white hair, the tips of the posterior veins with a black dot and a white spot between them, some of the anterior veins also usually tipped with a black dot; most of the fringe on the anterior margin is black, but near tip and on posterior margin gray or whitish, where it is four times as long as the width of a cell; the legs are black, with black hairs and scales and a few white scales at the tip of the joints. The male antennæ are black, quite thick, shorter than the width of wing, with short, black and longer gray appressed hair; in the female the antennæ are more slender and more sparingly clothed. There are a few patches of white hair on the head. The wings are quite broad, but hardly as acute at tip as in some species. The genitalia are not prominent, being concealed by the long black hair of the abdomen. The inferior appendages of the male are black,

approximate, short and blunt; they are not much more than one-half as long as the diameter of the tip of the body, and but little upcurved; the superior pair are nearly as long, stout, and tapering to a point; they are wide apart at base, but curve toward each other. The ventral plate of the female is broad, yellow at tip, and broadly notched, but the notch is but one-half as deep as wide; the ovipositor is twice as long as plate and a little curved. Length of wing 2.5–2.9 mm."

Hab.—Sea Cliff, N. Y., and Battle Creek, Mich.

Psychoda schizura Kincaid.

Psychoda schizura Kincaid, Entomological News, X, p. 32 (1899).

"*Female.*—Body whitish, clothed with gray hair on the thorax and silvery white on the abdomen. Legs whitish, becoming darker basally, clothed with white hairs and scales. Wings a little more than twice as long as broad, rather acutely pointed at the apex; hair upon the veins white and black, distributed in alternate patches, so as to give the surface of the wings a mottled appearance; well-marked patches of black at the apex of veins: fringe on posterior margin gray; length of wings 2.7 mm. Antennæ not as long as the width of wing, 15-jointed; basal joints not much larger than succeeding ones; joints 3–15 globular, separated by slender pedicles, which are about as long as the nodes, each joint bearing a verticillate tuft of white hair. Ventral plate V-shaped; ovipositor short.

"*Male.*—Smaller than female. Inferior appendages extremely long, 3-jointed; joint 1 stout, cylindrical; joint 2 almost twice as long as 1, enlarged at the base and tapering to the apex; joint 3 minute, clavate. Superior appendages as long as first joint of inferior, 2-jointed, tapering to an acute point."

Hab.—Seattle, Wash., August 13th to September 1st.

Psychoda floridica n. sp.

Head and thorax yellow, clothed with light gray and black hair, the latter predominating on the thorax; abdomen black, variegated with brown between the segments; clothed with gray and smoky hair; tuft of long, smoky gray hair on posterior edge of thorax extending over half way to tip of abdomen. Females larger than males; length of wing 2.75–2.9 mm.; breadth 1–1.1 mm. Males: length 2.15–2.22 mm.; breadth .75–.80 mm. Wings rather acutely angulated at tip of median vein; evenly and well clothed with light gray hair; with distinct blotches of black; tips of all the veins except 5–7–9 with rather distinct patches of black hair; that at tip of 6 extending basally almost half-way to the furcation; that on 4 extending hardly so far; blotch at tip of first vein extending out onto the fringe and across onto vein 2; anterior fringe darker than posterior; posterior quite broad; cubital furcation slightly nearer base than tip of wing; about one-eleventh length of wing nearer base than radial furcation. Antennæ equal the breadth of wing, 13-jointed; basal joints stronger than succeeding ones; first longer than broad, second globular, 3–12 with basal enlargements and slender pedicles; 13 with basal enlargement and terminal spike bearing three slight enlargements; pedicles of median segments much longer than nodes; each node with dense, long grayish whorl, which includes the base of the succeeding segment; nodes yellow, pedicles lighter. Legs pale yellow, with light hairs and scales. Ventral plate bright yellow, as long as broad, cleft so as to have a bilobed appearance. Ovipositor .25 mm. long, not twice as long as plate, darker than

plate, curved downward. Male genitalia strongly developed; basis of inferior pair twice as broad as long, angulated behind and at outer margin; inferior pair over twice the length of plate, strong, enlarged at base, straight to beyond middle when it curves considerably upward, tapers gradually from middle to a rather acute tip, which bears a single clavate tenticle; clothed with strong, bristling hair. Superior pair 2-jointed; the basal joint shorter but stronger than the second, which is only slightly enlarged at base and tapers toward the tip; curved slightly toward tip; armed with short spinules on inner margin; wide apart at base, but curving inwardly so that the tips almost meet. Intromittent organ short, spike-like.

Hab.—Lake City, Florida. Bred in the laboratory at University from aquatic larvæ, February, 1906, and later dates. The immature stages are described by the writer in the second part of this paper as "An Aquatic Psychodid from Florida."

Psychoda cinerea Banks.

Psychoda cinerea Banks, Canadian Entomologist, XXVI, p. 331 (1894); XXVII, p. 324 (1895); XXXIII, p. 274 (1901); Kincaid Entomological News, XII, p. 193 (1901).

Psychoda pacifica Kincaid, Entomological News, VIII, p. 143 (1897); X, p. 31 (1899).

"Thorax and abdomen with long gray hair, a tuft of black hair at base of wing; wings with gray hair and fringe, the latter on the posterior margin nearly three times the width of a cell; legs pale, with long, gray and short white hair, and black scales on the tarsi. Antennæ slender, a little longer than the width of the wing, base of joints blackish, each joint with a whorl of white hair; wings about as broad as in *Ps. alternata*, acute at tip. The inferior pair of male appendages is long, contracted in the middle, swollen beyond, then growing slender and curving upward, clothed beneath with white hair; the superior pair much shorter and curved downward near tip, they are quite suddenly swollen near the middle; ventral plate of female as broad as long, slightly emarginate behind and with short scales; the ovipositor quite prominent and slightly curved. Length of wing 2.1–2.8 mm."

Hab.—Sea Cliff, N. Y., and Pacific Coast from Alaska to California.

Psychoda elegans Kincaid.

Psychoda elegans Kincaid, Entomological News, VIII, p 144 (1897).

"Length 1.6–2 mm. Thorax and dorsal surface of abdomen brown; lateral margins of abdomen dull white; ventral surface of abdomen brownish, varying to dull white. Thorax and abdomen sparingly clothed with gray hair. Legs brown, clothed with gray hair and scales. Wings lanceolate, acutely pointed, with gray hair upon the veins; fringe gray, sparse, short upon anterior margin, somewhat longer than posterior margin; antennæ brown, one and one-half times as long as breadth of wing, 16-jointed, with verticilate hairs upon the nodes; joints 1–3 closely joined, 3–13 separated by slender pedicles; joints 14–16 small, narrowly separated; male genitalia brown, with gray hair above and below, somewhat prominent. Inferior appendages moderately long, curving dorsally,

3-jointed; first joint broad at base, conical; second joint as long or a little longer than first, swollen at base, tapering; third joint extremely slender, cylindrical, about one-sixth as long as second joint. Superior appendages about one-half the length of inferior, 2-jointed; first joint stout, ovate; second joint slender, longer than first, tapering to an acute point. Ventral plate of female brown, with numerous gray scales and a few scattering hairs, about as long as broad, terminating posteriorly in two prominent lobes, with a semi-circular emargination between; ovipositor black, prominent, strongly curved."

Hab.—Seattle, Washington, March and April.

The writer has not had an opportunity of examining this and the preceding species, but from Kincaid's descriptions they seem to be very nearly the same. *P. cinerea* has been found to be a widespread and rather variable species, so that it is not at all improbable that when the field is more closely worked the identity of these two species will be established.

Psychoda minuta Banks.

Psychoda minuta Banks, Can. Ent., XXVI, p. 331 (1894); XXXIII, p. 274 (1901).

"Dark, with whitish hair on thorax and gray on abdomen; wings thinly clothed with gray hair and a gray fringe, which at the posterior margin is about twice as long as the width of a cell; legs dark, with whitish hair. Antennæ not quite as long as breadth of wing, black at base of joints, and each joint in male with a dense whorl of white appressed hair, which gives the antennæ a very heavy and thick appearance; in the female the whorls are quite loose. Wings much broader than in the other species, and more blunt at tip. The inferior pair of male appendages are very long, slender and gradually tapering, strongly curved upward and nearly black, with white hair beneath, the superior pair not half so long, tapering and diverging. Cannot make out the structure of the female ventral plate. Length of wing 1.6 mm."

Hab.—Sea Cliff, N. Y., and Mesilla, N. M.

Psychoda longifringa n. sp.

Body dark brown, densely clothed with light bluish-gray hair. Legs brownish, with light hairs and scales. Wings rather acutely angulated at tip of the second simple nervure; length 1.3 mm.; breadth .5 mm.; posterior fringe very dense, one-half the breadth of wing; same color as hair on body; anterior quite narrow, but also very dense; hair on veins uniformly distributed; light bluish-gray, with scattered darker hairs; cubital bifurcation one-sixteenth the length of wing nearer base than the radial; about three-eighths the length of wing from base. Antennæ 13-jointed; 1–2 short, stout; 3–13 each with basal enlargement and dense whorl of erect hairs; terminal spike of 13 long, without perceptible enlargements; nodes dark, pedicles lighter; whorls light grayish, except last, which is snow-white; pedicles 4–8 longest, one and one-half length of their nodes. Tarsi darker than rest of leg, densely clothed with scales and hairs. Inferior pair of male genitalia well developed, length one-half the breadth of wing; base considerably enlarged, tapering to rather acute tip, which bears a

single strong clavate tenticle; sickle-shaped, wide apart in their median portion, but converging at base and tip; basis of inferior pair truncate on outer margin, tapering toward base, slightly over one-half length of inferior appendages. Superior pair poorly developed, hidden among the tufts of hair on abdomen.

Hab.—Lake City, Florida. Single male specimen taken in the laboratory at the University in the middle of February, 1906.

Psychoda uniformata n. sp.

Body dark brown to black, sparingly clothed with white and light blue hair, some darker on the thorax. Legs dark brown, with closely applied, scattered light hair and scales. Wings acutely angulated exactly at tip of second simple nervure, evenly and well clothed with white and smoky hair; anterior fringe smoky, darker toward base, narrow, about one-third breadth of posterior, which is one-half the width of wing; posterior light, except for a smoky black patch extending half-way to base of wing from tip of tenth vein; anterior bifurcation in middle of wing; posterior three-eighths length of wing from base. Length of wing 1.3–1.6 mm.; breadth .45–.55 mm. Length of antennæ equal breadth of wing, 15-jointed; basal joint cylindrical, second spheroidal, 3–12 with basal enlargements, separated by slender pedicles, 13 spherical; 14 reduced, spherical; 15 small, with terminal spike; 13–14–15 closely joined; each node with whorl of erect hairs. Ventral plate as long as broad; length .1 mm.; cleft more than half-way to base; yellowish-brown, clothed with scattered fine white bristling hairs. Ovipositor well developed, strong, considerably curved, not acutely pointed at tip; dark brown, lighter toward base; length one-sixth millimeter.

Hab.—Columbia, Missouri. Six female specimens taken in laboratory by light, September 17–26, 1906.

Psychoda nocturnala n. sp.

Head and thorax light brown; abdomen darker, clothed with light gray hair; tuft of darker between base of wings; tip of abdomen with long white hair. Legs light yellow, clothed with light hairs and scales; tip of tarsi darker; tibiæ with row of erect, spine-like black hairs. Wings acutely angulated at tip of median vein; anterior fringe narrow; posterior one-third breadth of wing, smoky, lighter toward base, where there is a large tuft of long hairs having a yellowish cast; veins sparingly but uniformly clothed with smoky black hair, intermingled here and there with patches of lighter; tip of anterior veins and vein 6 with indistinct tufts of short black hair. Tip of veins 8 and 10 with rather distinct tufts; radial furcation near middle of wing; one-tenth length of wing nearer tip than cubital furcation. Length of wing 2.5 mm.; breadth .9 mm. Basal joints of antennæ stronger than remaining; first longer than broad, second globular, its diameter greater than that of first; remaining segments with strong basal enlargements, their length about equal that of slender pedicle; nodes sparingly clothed with whorls of light hair. Ventral plate as broad as long; about one-seventh millimeter; cleft almost to base; lobes widely diverging; at base of plate on either side is a very small, yellow, downwardly projecting structure densely clothed with hair, resembling a cercus; ventral plate yellow; ovipositor same color at base, darker toward tip; base almost as broad as plate;

almost straight; twice as long as breadth of plate; tapering gradually to rather acute tip.

Hab.—Columbia, Missouri. Single female taken in laboratory by light, September 23, 1906.

Psychoda signata Banks.

Psychoda signata Banks, Canadian Entomologist, XXXIII, p. 274 (1901).

"Head and thorax clothed with white hair, some tufts of gray at bases of wings; antennæ white, about as long as width of wing; legs white, last few tarsal joints black, and a black ring on base of the first tarsal joint of hind legs; abdomen clothed with white hair. Wings marmorate with pale gray and blackish, rather thinly clothed with hair; a blackish patch near base, another rather before the middle from costa to center of wing, one on posterior part about behind this one, a long one along the apical costal third of wing, often interrupted by three pale spots, and a few small patches on the apical third of hind margin; all these spots are blackish, irregular, and of indistinct outline. The fringe on costal margin is largely gray, but with two white patches and the apex white; on middle of hind margin is a long white portion, the rest of the fringe is blackish; the fringe on the hind margin is about one-third the width of the wing. Length of wing 2 mm."

Hab.—Washington, D. C., in May.

Psychoda alternata Say.

Psychoda alternata Say, Williston, Entomological News, IV, p. 114 (1893); Banks, Canadian Entomologist, XXVI, p. 330 (1894); XXVII, p. 324 (1895); Kincaid, Entomological News, XII, p. 193 (1901); Banks, Canadian Entomologist, XXXIII, p. 274 (1901); Eaton, Ent. Mo. Mag., IX, p. 123 (1898).

This is evidently a most variable and widespread species. *Ps. sexpunctata*, found throughout Europe and Northern Africa, has recently been identified as *Ps. alternata* Say, which has been found to range throughout the United States, from the Atlantic to the Pacific. The writer collected quite a number by light between August 15th and September 27th, here at Columbia. These vary considerably among themselves, and differ in many respects from Banks' description of *Ps. alternata*, especially in size and darker shade. The thorax and anterior portion of abdomen varies from light yellowish to brownish-black; the posterior portion of the abdomen being lighter. In some specimens the patches at the tips of the veins are brown, and the wings conspicuously marked with black. The patches at the tip of veins 4 and 6 are usually bordered within with a patch of white, and sometimes white patches are present next to other of the apical blotches of black; posterior fringe almost one-half breadth of wing. The antennæ are 14-

jointed, as long as breadth of wing; the first segment longer than broad, second globular, 3–12 with basal enlargements and slender pedicles; pedicle of 12 short, but not reduced so much as shown in figure; 13 spherical, closely joined to 14, which has a terminal spike. Ventral plate almost as broad as long, cleft over half-way to base. Ovipositor quite strong, slightly curved, tapering gradually to rather acute tip, one fifth millimeter long. Inferior male genitalia very long, slender, sickle shaped, with strong clavate tenticle at tip; basis of inferior appendages with short median terminal spike; rounded laterally and only slightly tapering toward base; superior male appendages 2-jointed; basal segment strong, shorter than terminal one, which is slender, with acute tip, bearing short spinules. Intromittent organ longer than terminal segment of superior appendages, slender, slightly curved downward. Length of wing 1.6–1.75 mm.; breadth .6–.7 mm.

Two specimens received from Lawrence, Kansas, one through the kindness of Prof. F. H. Snow, from the University collection, the other from Mr. E. S. Tucker's private collection, are much lighter than the writer's specimens. The wings are slightly denuded, which probably accounts for the absence of the black apical spots on the veins. They are about the same size as the Missouri specimens.

Hab.—Found throughout the United States.

Psychoda opposata Banks.

Psychoda opposata Banks, Canadian Entomologist, XXXIII, p. 274 (1901).

"Head and thorax clothed with pale gray hair; antennæ thick, gray, longer than width of wing; abdomen clothed with rather short gray hair; legs brown, none of the tarsi marked with white. Wings thickly clothed with pale gray hair; near base is a band of black hair, heaviest behind; slightly beyond the middle of the wing there is a black spot on the costal margin and another opposite on the posterior edge, the latter rather the larger; the extreme margin around the tip appears more or less black. The fringe is mostly pale gray or almost white on the hind margin; on the base of the costal margin it is dark gray; that on the posterior margin is almost one-half the width of the wing. Wings rather narrow and acute at tip. Length of wing 1.7 mm."

Hab.—Taken at Washington, D. C., in the early part of August.

Psychoda sigma Kincaid.

Psychoda sigma Kincaid, Entomological News, X, p. 31 (1901).

"*Female.*—Body yellowish-white, clothed with cream-colored hair; wings ovate, apex obtusely rounded, more than twice as long as broad, clothed with cream-colored hair upon the veins, except an indistinct S-shaped band of black across the middle; fringe quite dense and long, cream-colored, except two patches

of black at the anterior and posterior terminations of the S-shaped discal band; length of wing 2.5 mm. Legs yellowish-white, clothed with cream-colored hairs and scales. Antennæ longer than the width of the wing, 14-jointed, with verticellate whorls of cream-colored hair upon the nodes; joints 1-2 small, closely united; joints 3-13 globular, separated by slender pedicles; joint 14 minute. Ventral plate yellowish, very narrow at base, broadening toward the apex, which is produced into divergent lobes; ovipositor yellow, short, almost straight.

"*Male.*—Smaller than female, with the black band upon the wings less clearly evident. Genitalia conspicuous, brown, clothed with long cream-colored hair. Inferior appendages 3-jointed; joint 1 stout, cylindrical; joint 2 twice as long as 1, slender, slightly swollen at base, curving upwards; joint 3 very slender, cylindrical, tapering at apex. Superior appendages not as long as the basal joint of inferior; 2-jointed; joint 1 stout; joint 2 tapering to an acute point."

Hab.—Olympia, Washington. June 24 to July 1, 1897.

FLEBOTOMUS.

The genus *Flebotomus*, or *Phlebotomus* as it has been amended by European entomologists, unwarrantedly, according to Coquillett, has just recently been recorded from North America. Two species are reported from our Continent. The females of this genus have the blood-sucking habit of the mosquitoes. The third anal vein is wanting or hardly distinguishable from the anal furrow, and there are two simple veins between the forked ones.

Flebotomus vexator Coquillett.

Flebotomus vexator Coquillett, Entomological News, XVIII, p. 102 (1907).

"Yellow, the mesonotum brown, hairs chiefly brown; legs in certain light appear brown, but are covered with a white tomentum; wings hyaline, unmarked; the first vein terminates opposite one-fifth of the length of the first submarginal cell; this cell is slightly over twice as long as its petiole; terminal horny portion of male claspers slender, bearing many long hairs; the apex terminated by two curved spines, which are more than one-half as long as the preceding part, and just in front of these are two similar spines, while near the middle of the length of this portion is a fifth spine similar to the others. Length 1.5 mm."

Hab.—Plummer's Island, Maryland. June 23rd to July 29th. Type No. 10154 U. S. Nat. Mus.

Flebotomus cruciatus Coquillett.

Flebotomus cruciatus Coquillett, Entomological News, XVIII, p. 102 (1907).

"Same as *vexator*, except that the hairs are chiefly yellow, and the first submarginal cell is about three times as long as its petiole. *Male* unknown."

Hab.—Cacao, Trece Aguas, Alta Vera Paz, Guatemala. April 2nd to 26th. Both of these species were collected by Messrs. H. S. Barber and E. A. Schwarz. Type No. 10155 U. S. Nat. Mus.

TRICHOMYIA.

Members of this genus have but a single simple vein between the forked radial sector and cubital; 15-jointed antennæ; third anal vein not greatly reduced and with distinct ventral plate and ovipositor. Kincaid's *Sycorax lanceolata* is clearly a *Trichomyia*. In the Kansas University collection the writer finds a new species of *Trichomyia*, collected by Professor Snow in Arizona. Prof. F. L. Washburn recently reported a *Trichomyia* from Minnesota,* but he informs the writer that he is unable at present to locate either his specimens or authority.

Trichomyia lanceolata Kincaid.

Sycorax lanceolata Kincaid, Entomological News, X, p. 35 (1899).

"*Female.*—Body brown, clothed with brown hair which appears black in some lights. Wings extremely narrow, four times as long as broad, apex sharply acuminate and pointed exactly at the tip of the simple nervure; anterior and posterior bifurcations distant from the base of the wing respectively two-thirds and one-third the wing's length; veins unevenly clothed with brown hair, similar to that upon the body; fringe very heavy, colored similar to the hair upon the veins, on the posterior margin somewhat shorter; length of wing 2 mm. Legs brown, clothed with brown hair, except on the basal joints of all the tarsi, which are covered with white hair. Antennæ short, stout, about three-fourths as long as the width of the wing; 15-jointed; joint 1 cylindrical; joint 2 globose, larger than succeeding joints; joints 3-15 linear and sparsely clothed with brown hair. Ventral plate elongate, broad at base and narrowed toward the apex, which is bilobed and linearly emarginate."

Hab.—Palo Alto and Santa Cruz Mountains, California, and Almota, Washington. August 3rd to 9th.

Trichomyia unipunctata n. sp.

Length of wing 2.5 mm.; breadth .45 mm.; anterior bifurcation 1.2 mm. from tip; posterior furcation 1.5 mm. from tip; subcosta long, linked to costa on a level with the apex of vein 10; vein 10 not reduced as in European *Sycorax*, linked to wing margin about two-fifths the distance from base; wing long, slender, narrowly rounded at tip of simple vein; fringe broader at base, decreasing toward tip; posterior much broader than anterior; breadth of posterior at base of wing .75 mm.; anterior scarcely .5 mm.; fringes black, lighter toward base; tip of wing with tuft of long snow-white hairs, which, mounted in balsam, appear banded; veins rather densely clothed with closely applied dark, and erect, black hairs; the latter collected in two distinct transverse bands, a broad one between the bifurcations and a narrower one on a level with the apex of veins 3 and 6. Antennæ 15-jointed; basal segments larger than remaining; first cylindrical; second spheroidal; 3-15 cylindrical, sparingly clothed with hair; some with conspicuous annuli on their dorsal surface, making the antennæ appear more than 15-jointed; 1-2 clothed with white scales; 3-4 sometimes with scales also; length

* Minn. Agr. Exp. Sta., Bull. 93, p. 35.

of antennæ .5 mm. Thorax light yellowish; abdomen darker, clothed with short black and white and long dark hair; legs light, with closely applied white hairs and scales and scattered erect darker hairs; tarsi lighter than rest of leg; tip of hind tarsi yellowish-brown. Tip of ventral plate narrow, with shallow emargination and rounded lobes; ovipositor concealed in long hair of abdomen. Readily distinguished from *P. lanceolata* by larger size, much broader and heavier posterior fringe, white tuft of long hair at tip of wings, venation and two travsverse black bands on wings.

Hab.—Oak Creek Canon, Arizona. Two specimens from the collection of the Kansas University. Collected by Prof. F. H. Snow in August.

Since writing the above the writer has taken a number of specimens of *Ps. alternata* (March), and *Ps. horizontala* (April). One species of the collection received from the Kansas University, being considerably denuded of hair, was difficult to locate, but is probably *Ps. nocturnula.*

An Aquatic Psychodid from Florida.

On the 19th of December, 1905, the writer collected a few lily pads and a little hay with which to make a culture for *Paramecium.* After the class had completed the work on the *Paramecium* the culture was left standing in a large glass jar. In the latter part of January some very large mosquito larvæ and pupæ were found in the culture, and desiring to find out what species of mosquito they were, a cover was placed on the jar and the emerging of some of the pupæ awaited. On the afternoon of February 1st the jar was again examined and a few specimens of the mosquitoes were taken, and along with them some very small fuzzy insects, which were at once found to be flies. The next day on making a closer examination of the contents of the jar a large number of pupæ and full-grown larvæ were taken. On the morning of February 3rd a single batch of eggs was found. They had been deposited the night before by a female whose wings had become stuck to the glass cover. And again, on the morning of the 6th, a second brood of very young larvæ was found. Then all the life history material needed was at hand.

In locating this peculiar little fly, which was found to be a very easy task, so far as the family was concerned, since its superficial characters at once disclosed it to be a moth-fly, the writer was greatly surprised to be unable to find scarcely any literature on the

life history of the North American members of this family. Prof. Kellogg's account of *Pericoma californica* Kin. contained our present knowledge of the life history of the North American Psychodidæ. *Psychoda cinerea* Banks was reared on manure by Kincaid, but the younger stages were not secured. Professor Kellogg also mentions the discovery of two pupæ in a small stream in the Rocky Mountains of Colorado, which he thinks are Psychodid pupæ, but different from the pupæ of *P. californica*. The thoracic breathing tubes are long, tapering and flexible, but the flat, adherent, shield-shaped body is as in *P. californica*.

The life history and breeding habits of a number of the European Psychodids have been studied in detail. Verrall bred *Ps. humeralis* Meigen from putrid snails, and Gunerthal bred the same from larvæ feeding on rotten potatoes. C. O. Waterhouse reared *Ps. albipennis* Zetterstedt upon decaying turnips, and it was also bred upon other decaying vegetable matter. The larvæ of *Ps. phalænoides* Linné has been found to feed upon all sorts of decaying vegetable matter. The larvæ of some European Psychodids have been found to feed upon cow-dung.

The account of the aquatic Psychodid larvæ and pupæ discovered by Fritz Müller in Brazil some twenty six years ago, and the paper by Miall and Walker on the life history of *Pericoma canescens*, together with other notes on the early stages of Psychodidæ, are found in the "Trans. Ent. Soc. Lond., 1895." Through the kindness of the Kansas University the writer has recently had an opportunity of reviewing these papers.

Haliday has characterized the different groups of larvæ of the European Psychodids as follows:

Larva pale, terrestrial, the last segment slender, much elongated. **Psychoda.**

Larva blackish, last segment little elongated, jagged at the end and ciliated with radiating hairs.

Larva with two double rows of lanceolate (gill-like) plates down the back. **Ulomyia.**

Larva with two bands of curved hairs down the back ..... **Pericoma.**

The larvæ of the genera *Pericoma* and *Ulomyia* are reported as inhabiting water, while the larvæ of *Psychoda* are described as terrestrial, feeding upon mushrooms and decaying potatoes. The Florida larvæ, while not terrestrial, agree in other details much

more closely with Haliday's *Psychoda* than *Pericoma*, and the adults certainly belong to the old genus *Psychoda*. The writer believes that a more thorough study of the life histories and a careful comparison of the European and American material will do much toward establishing a more perfectly satisfactory systematic classification of this family of flies.

The aquatic Psychodid discovered by Professor Kellogg in California, and described and figured by him in the February number of the "Entomological News," 1901, is of the same general type as the Brazilian forms, although it differs in many details. The larva is broad, with eight ventral suckers. The trachial gills present in the Brazilian larvæ were not found in the California specimens. The pupa is flat and broad shield-shape, adhering to the surface on which it rests.

On comparing the aquatic Psychodid from Florida with *Ps. californica*, the writer finds very little correspondence. It is more nearly of the type of Miall's aquatic form. The larva is long, slender and cylindrical, without the least sign of ventral sucking discs and anal trachial gills. It is semi-aquatic, being able to remain under water for sometime without coming to the surface to breathe. The pupa is of the usual Tipulid-like type, being cylindrical, rather slender and possessing long, flexible thoracic breathing tubes.

It will probably be well to include a few notes on Professor Kellogg's aquatic larvæ and pupæ before turning to the life history of the Florida species.

The larvæ were found abundant on the first of March and later dates in the mountain streams of Santa Clara County, California. They were present on the stones at the verge of the water, where they were kept moist by the sprays and current. When full grown they attain a length of 2.5 mm. and a breadth of 1 mm. From the figures they appear flat, but they are rather thick and the dorsal surface quite firm. On the ventral surface are eight median segmentally arranged suckers, by which they hold firmly to the surface of the rocks. There are no thoracic breathing tubes and openings as described for *Pericoma* by Miall, but simply a pair of anal spiracles at the tip of the abdomen, between two strong, haired, clavate processes. And no trace of the anal trachial gills, described by Müller for the Brazilian larvæ, was found, though they may have been retracted.

The pupæ were found along with the larvæ, though usually a little higher up on the rock. They are 2.5 mm. in length and 2 mm. wide at the middle; broad, shield shaped, flat and adherent. The pair of short, clavate, prothoracic breathing tubes are cylindrical, with a fine mesh-work covering. The dorsal surface is strongly chitinized, while the flat, adherent ventral surface is not, and the folded wings and legs lie uncovered, although protected by the dorsal wall. The pupæ are without ventral suckers, but the adhesion is sufficient to prevent the occasional splashes of water which strike them from carrying them away. The pupæ were found March 1st, and the larvæ were first noted at this time also. By the 5th of April they were more abundant than the lavæ, and adults were emerging at that time.

The egg, larval and pupal stages of the Florida Psychodid are discussed separately. The adult fly is described in the first part of this paper as *Psychoda floridica* n. sp.

EGG.

The eggs are laid in irregular shaped masses, presumably on the surface of the water, or on objects at the surface, where they are kept moist by the water drawn up by capillary attraction, for the young larvæ were first found on the sides of the jar just above the surface of the water. The single packet which the writer was so fortunate as to find contained about three hundred eggs, and each of the two packets, from which the two broods of larvæ came, must also have contained at least three hundred. About half of the eggs contained in the packet were placed in a shallow vessel of water, but none of them developed. Either they were not fertilized or their natural place of deposition is not under water. The former is, perhaps, the correct explanation for their failure to mature.

The egg is about a quarter of a millimeter in length, oval in shape, and with its length equal to three times its middle diameter. The yolk composes about half of the egg and is centrally located, causing that part to be quite opaque, while the remainder is clear. The wall of the egg appears to be divided up in small, circular patterns. As to the time required for the eggs to hatch the writer is unable to make a definite statement, but judging from the appearance of the second brood, he would place the upper limit at seventy-two hours, and most likely a shorter time is sufficient.

LARVA.

The young larvæ make their appearance on the sides of the jar just above the surface of the water. Here they remain for some time, feeding upon the decaying vegetable matter found in the surface film. The number of moults cast was not determined, but specimens from 2–3 mm. long were found moulting. The skin splits open along the top of the head and thorax, after which the larva crawls bodily forward, leaving the moult behind. In one instance under observation the moult refused to slip, and in the struggle to free itself from it the larva severed one of the main tracheæ near the posterior end, and died within a few minutes.

About one day after the larvæ hatch they become quite active, descending into the water, where, apparently urged by an unquenchable hunger, they scramble over and gulp in with their fang-shaped mandibles all that their spacious alimentary canal will hold, after which they return to their "airy" perch, so to speak. This operation is repeated from time to time, the older larvæ spending most of the time in the water.

There are no ventral sucking discs whatever. They stick to the glass simply by means of a film of water and perhaps a slime-like secretion, which continuously surrounds them and often makes it very difficult to study the more minute details.

The anal breathing tube is somewhat similar to that of mosquito larvæ, although it is relatively much stronger. The two main tracheæ run side by side and open separately at the end of the tube. The external openings are armed with strong, lanceolate cilia, mounted upon three small, retractile processes. The two main tracheæ may be traced forward to the thoracic region, where each will be seen to have a side branch, which terminates as a short, black nipple on the dorsal surface of the prothoracic segment. While these thoracic air nipples are present in the younger larvæ, they are not so pronounced as in the older. They are slightly protractile in the older larvæ. The writer noticed in one living adult larva just before pupating that these nipples had already taken on the elongated structure of the thoracic breathing tube of the pupæ, but he has been unable to find examples of it in his preserved material. In larvæ that are "most at home" in water just deep enough to cover their bodies, it can well be seen how these nipples can be used to advantage in respiration, but in these larvæ which have

feeding habits similar to mosquito larvæ, the advantage is less apparent. While feeding near the surface the tip of the abdomen is protruded above the water, while the head hangs down or is bent around so as to feed on floating vegetable matter. The larvæ are never particular about keeping the nipples above water, and bubbles of gas are not seen to come off from them as from the anal spiracles. If these nipples really have spiracles they are unprotected and certainly of little importance as compared with the anal spiracles, but the writer thinks that, in this species, they are simply the rudiments of the prothoracic tubes of the pupa and not used for respiration in the larva.

After carefully examining a great number, both of living and preserved specimens, the writer is led to conclude that there are no true anal tracheal gills. Several were examined under the high power of the microscope, and although a series of low papillæ were seen to surround the anal opening, no tracheæ were found in them, nor were retracted gills present. In order to verify the conclusions reached by the microscopical examination, the following experiment was performed :

Three larvæ, one very young, one half grown, and the third almost full grown, were submerged in a vessel of water under a small rubber ring to which a glass cover had been cemented. There was perfect communication between their little apartment and the surrounding water, and they were given an abundance of food. They were placed under the cover on the morning of February 9th, and on examining in the evening were found to be still alive, but on the following morning were all dead. They were examined from time to time during the experiment, and it was noted that the anal papillæ became enlarged and protruded somewhat from the body. It is very probable that these papillæ are more strongly developed and possess true tracheæ in some Psychodids, as described and figured by Müller for the Brazilian form, but the tracheæ are certainly absent in this species.

Concluding from this experiment and from the microscopical examination the writer is led to infer that in the larval stage of this species respiration is carried on principally through the system of tracheæ, which have their external openings at the posterior end of the body and possibly in the thoracic air nipples. Although the experiment would seem to suggest that some oxygen is received from the water, it is evident that this supply is far too inadequate

to sustain life for any considerable length of time. While feeding the larva usually allows the tip of the tube to extend out of the water, and when it descends into the water it is seen to throw off bubbles of gas and invaribly returns to the surface after a very short time.

The segmentation is rather indistinct in living specimens, especially in very young and some of the old ones. In cleared specimens the three thoracic and eight abdominal segments can be clearly made out. The annulation is much less distinct than in *Pericoma canescens*. The fifth and sixth abdominal segments each have three distinct annuli and the seventh two. The remaining abdominal and thoracic segments are without distinct annuli. There is no marked break between the abdominal and thoracic regions of the body. The body is all covered with very fine, spine-like cilia, together with one or two long hairs on each side of the segments. The head is dark brown in color, which makes it quite difficult to detect the small, black pigment eye spots. The antennæ appear to consist of tufts of plates as in *P. canescens*. The central part of the body is opaque, due to the presence of great quantities of food in the alimentary canal. The anal breathing tube is usually heavily charged with dark pigment, especially at the tip. The annuli of the fifth and sixth segments and the second annuli of the seventh, together with the eighth segment, are each armed above with a small, chitinous shield. These shields decrease in size anteriorly and are entirely absent on the anterior segments. The adult larva is about 8 mm. long, and varies in diameter from about .6–1.3 mm. They are usually not so slender as the specimen figured.

PUPA.

The pupæ are found concealed in the débris at the surface of the water, where their prothoracic breathing tubes extend above the surface. They are relatively active, being able to move quite freely by the lashing of the abdomen. The transformation from the adult larva to the pupa has been found to take place within twelve hours. The pupa, as is seen from the figures, possesses a girdle of conspicuous spines on each abdominal segment, especially the posterior one, together with two curved ones on the tip of the last segment, which aid in locomotion. The eyes, antennæ, wings and legs are all distinguishable on the surface. The thoracic breathing tubes are long and flexible, with a short, much wrinkled stalk, and a wider, cylin-

drical terminal portion. Beyond the stalk the tube is rough and heavily charged with black pigment, except a narrow streak on the dorsal surface, which is lighter and bordered on each side with a row of small, circular papillæ. These papillæ also surround the tip of the tube and, according to Miall and Walker, are the external openings of the trachea. As can be seen from a side view, the anterior end of the pupa is much the heavier, the posterior end tapering to rather an acute point.

The pupal period seems to vary a great deal. In two instances the adult emerged after a pupal period of two and a half days, while in some cases the pupa persists as such for a week. The moulting and drying of the wings take place in a very short time. The writer has removed all the adults from the jar, and on returning an hour later has found a number of adults flying about in the jar. The pupæ vary somewhat in size, but average about 3.75 mm. in length and 1 mm. in breadth.

The immature stages of the Psychodids are unfortunately too little known. The writer has recently discovered an aquatic larva on the rocks above a waterfall near the University, which he thinks is a Psychodid larva, but is unable to say definitely until it matures. He thinks that the immature stages of other Psychodids can be obtained by means of prepared vegetable cultures and will work to this end during the coming spring and summer.

Since this has been written Prof. V. L. Kellogg kindly informs the writer that one of his students has just completed, for publication, the life history of one of the western species.

Acknowledgments.

The writer wishes to thank Prof. F. H. Snow and Mr. E. S. Tucker of Kansas University for the loan of specimens; also Prof. J. M. Stedman for helpful suggestions and kindly granting him time for working up this paper; and various other friends who have aided him greatly in this work.

Note.—Since this paper has been in the hands of the publishers, the descriptions of the following four new species—*Ps. quadripunctata*, *Ps. interrupta*, *Ps. basalis* and *Ps. apicalis*, by Mr. Nathan Banks—have appeared in the Proc. Ent. Soc. Wash., vol. viii, Nos. 3 and 4, p. 148; and the writer has secured a second aquatic Psychodid in prepared vegetable cultures, which will be described later.

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EXPLANATION OF PLATES.

PLATE V.

Figs. 1–2.—*Ps. snowii*, basal and terminal three segments of antenna.
" 3–4.—*P. scala*, basal and terminal three segments of antenna.
" 5–6.—*P. longiplata*, basal and terminal three segments of antenna.
" 7–8.—*T. unipunctata*, basal and terminal three segments of antenna.
" 9–10.—*P. trialbawhorla*, basal and terminal three segments of antenna.
" 11–12.—*Ps. horizontala*, basal and terminal three segments of antenna.
" 13–14.—*Ps. uniformata*, basal three and terminal four segments of antenna.
" 15.—*Ps. nocturnala*, basal three segments of antenna.
" 16–17.—*Ps. alternata*, basal three and terminal four segments of antenna; terminal segments too closely joined in figure.
" 18–19.—*Ps. longifringa*, basal three and terminal four segments of antenna.
" 20–21.—*Ps. floridica*, basal and terminal three segments of antenna.
" 22.—*T. unipunctata*, venation of wing magnified twenty-nine times.

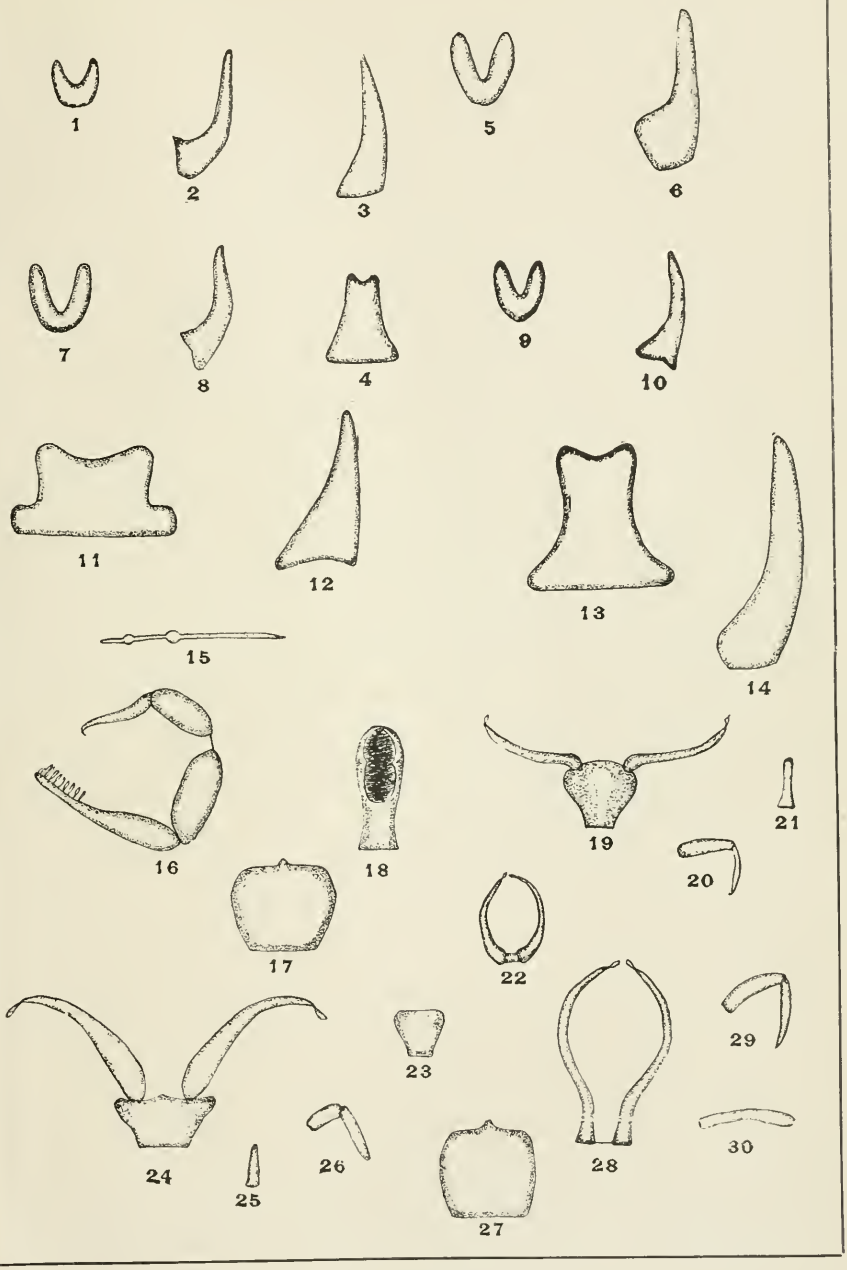
NOTE.

I find that a slight error has been made in the explanation of the magnification represented in Plates V–VIII of my paper on the Psychodidæ.

The magnification which has been used is that which my original plates represented. In the preparation of the plates my original drawings have been reduced about one-fourth, so that the figures as they appear are magnified only three-fourths of what the explanation gives them.—LEONARD HASEMAN.

Columbia, Mo., Jan. 9, 1908.

HASEMAN ON PSYCHODIDÆ.



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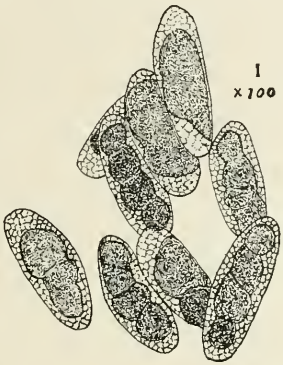

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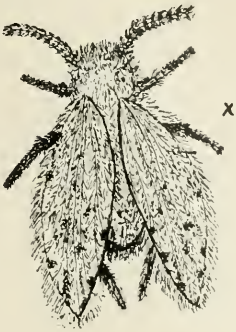
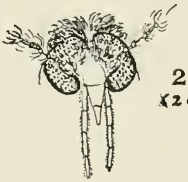
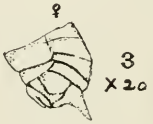
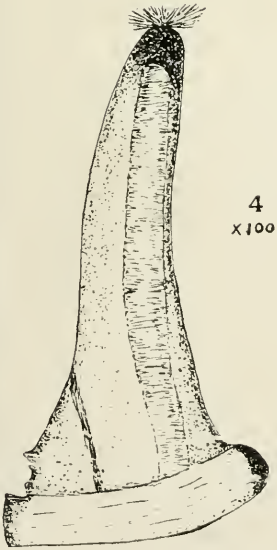
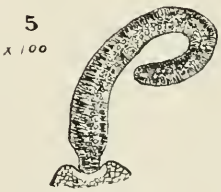










HASEMAN ON PSYCHODIDÆ.

PLATE VI.

Figs. 1-2.—*Ps. uniformata*, ventral plate and ovipositor.
" 3-4.—*P. trialbawhorla*, ovipositor and ventral plate.
" 5-6.—*Ps. nocturnala*, ventral plate and ovipositor.
" 7-8.—*Ps. floridica*, ventral plate and ovipositor.
" 9-10.—*Ps. alternata*, ventral plate and ovipositor.
" 11-12.—*Ps. snowii*, ventral plate and ovipositor.
" 13-14.—*P. longiplata*, ventral plate and ovipositor.
" 15-16-17-18.—*Ps. snowii*, knotted hair, much enlarged; side view of genitalia showing how the basis viewed side-ways can be mistaken for a basal segment of the inferior appendages; dorsal view of basis; dorsal view of intromittent organ, much enlarged.
" 19-20-21.—*Ps. horizontala*, basis with spread inferior appendages; superior appendages; intromittent organ.
" 22-23.—*Ps. longifringa*, inferior appendages; basis.
" 24-25-26.—*Ps. floridica*, basis with inferior pair of appendages; intromittent organ; superior appendage.
" 27-28-29-30.—*Ps. alternata*, basis; inferior appendages; superior appendage; intromittent organ.

PLATE VII

Psychoda floridica n. sp.

Fig. 1.—Eggs magnified 100 times.
" 2.—Dorsal view of adult larva magnified 18 times.
" 3.—Ventral view of larva.
" 4-5-6—.Three views of papa, magnified 11 times.

PLATE VIII.

Fig. 1.—Dorsal view of adult magnified 11 times.
" 2.—View of face of adult showing eyes, beak, palpi, etc., magnified 20 times.
" 3.—Lateral view of posterior end of female abdomen, magnified 20 times.
" 4.—Lateral view of anal tube showing trachea and cilia protecting spiracles, 100 times.
" 5.—Dorsal view of prothoracic tube showing short stalk and double row of circular papillæ, magnified 100 times.

NOTES ON CERTAIN DESCRIBED SPECIES OF GEOMETRIDÆ, WITH DESCRIPTIONS OF A FEW NEW SPECIES.

BY JOHN A. GROSSBECK, NEW BRUNSWICK, N. J.

In the course of my studies on the Geometridæ I have accumulated a number of notes which, for the most part, are based upon specimens in the Hulst collection at New Brunswick, N. J. These are presented in this paper, together with descriptions of several new species.

Rachela latipennis Hulst (Trans. Amer. Ent. Soc., xxiii, 254, 1896).

The single male type from California is the same as *Rachela occidentalis* Hulst (Trans. Am. Ent. Soc., xxiii, 254, 1896). This latter was described from Victoria, Brit. Col. (Danby), from one male and two females. The male is smaller than the average form of *occidentalis* and the maculation is well marked. *Latipennis* is a large moth and rather abraded, hence Hulst's comparison with *bruceata* instead of *occidentalis*. The specimen is certainly unlike the male type of *occidentalis*, but I have a series of intergrades both in size and ornamentation from British Columbia that leaves absolutely no doubt as to its correct position. *Latipennis* is described immediately after *occidentalis* on the same page and thus falls before that name.

Rachela hyperborea Hulst (Trans. Am. Ent. Soc., xxiii, 254, 1896).

The description of this species follows that of *latipennis*. The one type in the Hulst collection from Alert Island, Alaska, is smaller than any *occidentalis* I have seen and approaches *bruceata* in color. It may be an extreme northern form of *occidentalis* rather than a distinct species. The maculation is indistinct and otherwise exhibits the peculiarities effected by a cold climate.

Eucestia rotundata Pack. var. *arizonata* Grt. (Can. Ent., xv, 126, 1883).

I have a specimen from Yuma County, Arizona, received through Professor Smith, which from the description I take to be *arizonata* Grt. It is truly quite different from Packard's types of *rotundata* and therefore from his description, but Packard's specimens were old and worn and are otherwise so nearly like Grote's variety that the latter is hardly worth more than a synonym.

Mesoleuca (*Phileremе*) **californiata** Pack. (Proc. Bost. Soc. Nat. Hist., xiii, 399, 1871).

This species was described with others by Dr. Packard in the above publication in advance of his Monograph, and in a later volume of the same journal he gave a recognizable figure of it (xvi, pl. 1, fig. 12, 1874). In a note preceding the descriptions he stated merely that the species were collected in California, but the number of specimens of *californiata* was not given. In the Monograph the description was repeated, and from the localities and dates given there were at least four specimens.

In the Hulst collection there are four specimens as *californiata*, but which represent two species. Of one of these there are three examples, one of which is marked as having been compared with Packard's type. This, however, does not agree with either the description or figure of *californiata*.

In the Packard collection there are three specimens with printed type labels, and two bear written nam. labels in addition, one *Phileremе californiata*, the other *Scotosia californiata*. The latter of these two is the species that Packard described and figured, and is the same as the single specimen Hulst had under this name; the former is like Hulst's "typical *californiata*," of which he had three specimens. This has not been described, so is characterized below as *Hydriomena indefinata*, new species.

Californiata must be transferred to *Hydriomena*, though the change renders it necessary to rename it on account of its preoccupation in that genus. I should prefer to refer it to *Mesoleuca* where the name would not have to give way, but the distinctly flattened antennæ prevents its entrance into that genus. The name *packardata* is therefore proposed for *californiata*.

Hydriomena indefinata n. sp.

Expanse 39-44 mm. Palpi brown, white at tip, projecting in front of head almost as far as the distance between the eyes. Front and vertex brown, intermixed with dirty white scales. Antennæ flattened, light brown at the sides, dark brown above. Thorax even brown. Abdomen brown, the apex of segments pale yellowish, which is preceded by two dark brown dorsal spots. Primaries broad, with costal edge produced outwardly on basal half; outer margin slightly waved. Color, smooth brown, slightly darker in small basal and broad median areas, especially on anterior portion along extradiscal line of latter. Costa marked on basal half by five small yellowish spots. Cross lines a slightly deeper shade of brown than the ground color and very indefinite. Basal line situated not far out on the wing, strongly outcurved to radius, then turned inward almost

at right angles to costal portion of line. Externally this line is obscurely bordered by a narrow creamy yellow line which on the margin forms the first of the white costal spots. Intradiscal line not apparent. Median line vaguely indicated on lower half of wing, forming two large outward scallops between cubitus and anal veins, and another below this latter vein. Discal spot elongate, scarcely discernible. Extradiscal line formed by the exterior border of the median area; begins on costa about one-third in from apex and extends outwardly, scalloped between the veins to inner margin, being as a whole gently outcurved to Cu_2 then straight to inner margin. The acute angles on all the veins are marked with a spot of pure white, and on the costa is a yellowish mark just outward of the extradiscal line. A second extradiscal line is seen a little further out on the wing running parallel with the first. All the veins from the first extradiscal line to beyond the second are dotted black and creamy yellow. Subterminal line creamy yellow, extends from costa to R_4, and from there is apparent only on the veins as spots. Terminal line almost black, slightly scalloped and marked externally with a faint diffuse whitish dot in the angles of the individual scallops and on their apices by a sharply defined white dot. Fringe concolorous with ground color. Secondaries much paler brown than the forewings, very pale on costo-basal area and becoming darker outwardly. Three transverse lines are indicated on the outer third of the inner margin, from which shade lines may be traced across the wing. Terminal line deep brown, scalloped, though less than half as deeply as in *packardata* and with white dots as on primaries. Fringe concolorous with wing, the margin parallel with terminal line. Discal spot brown, small, but distinct. Beneath: the forewings are evenly very pale brown in the central portion, mixed brown and yellowish on the costal area and cream colored on the inner area. The costal part of the extradiscal line and the dotting of the veins is faintly reflected below. The hind wings are profusely peppered with brown scales over a yellowish back ground; the discal dot is small and sharply defined, and the transverse lines are indicated by brown dashes on the veins.

Hab.—Soda Springs, Siskiyou Co., Cal., April 30 and May 25.

Types: two males in the Hulst collection at Rutger's College.

The species differs markedly from *packardata* by its larger size, by the indefinite meculation and white spots on the veins, and, in the hind wings, by the much less scalloped terminal line, which in *packardata* is dentate. The third specimen in the Hulst collection, also from Soda Springs (August 19th), is so badly rubbed as to be almost unrecognizable. By the date of this latter specimen two broods are indicated.

Philereme nigrescens Hulst (Can. Ent., xxxii, 104, 1900), and **Philereme formosa** Hulst (Trans. Amer. Ent. Soc., xxiii, 276, 1896).

These two species must be transferred to the genus *Mesoleuca*. This disposes of the genus *Philereme* in North America, *multivagata* having already been put into *Mesoleuca* by Taylor, while *opti-*

mata is said by Dr. Dyar to be the same as *Coryphista badiaria* Hy. Edw. and generically distinct from *Philereme*. In the systematic arrangement *multivagata* and *nigrescens* may follow *Mesoleuca aurata* Pack. (= *cæsiata* of American authors), while *formosa* may fall in after *hersiliata* to which it is a close ally.

Mesoleuca aurata Pack. (Proc. Bost. Soc. Nat. Hist., xi, 51, 1866).

This name will have to be used for the American insect that at present goes under the name *cæsiata* Den. and Schiff. I have seen a large series of European specimens in the Packard collection and there are probably forty examples of the American species in the Museum of Natural History in New York. The position of the transverse lines is approximately the same in each, but in *cæsiata* they are dark brown, very clearly defined, and in strong contrast to the almost white ground color, whereas in *aurata* the ground color is gray, the lines are indefinite and can scarcely be followed across the wing in some cases, and these differences obtain throughout the series of each species. The illustration in Packard's Monograph, plate 8, fig. 16, represents the European species, though his description (l. c., p. 67) is that of *aurata*. Mr. Butler in Papilio, vol. i, p. 222, says after seeing a Californian specimen that it is not the *cæsiata* of Europe, the occurrence of which he doubts in America. Whether this note of Mr. Butler's was overlooked by later writers or whether they did not coincide with his opinion I am not in position to say; but at any rate he was never followed and *cæsiata* is still found on our latest lists.

A reference to *aurata* seems to have been overlooked by Packard in his Monograph, and not having the particular paper in which the description appears, the reference above was kindly furnished me by Dr. Dyar.

Mesoleuca atrifasciata Hulst (Ent. Am. iii, 214, 1888).

This species, originally described as a *Cleora*, was later referred as a synonym of *Mesoleuca truncata* var. *thingvallata* (Ent. News, vi, 43), which variety now appears in Staudinger's latest list as an aberration of *immanata*. In Dyar's Catalogue it is cited as a synonym of *immanata*, not even varietal rank being accorded it. In the Hulst collection a female specimen of *atrifasciata* stands as a *Eustroma*, where it would seem to belong as far as habits is concerned. I have recently seen an unnamed male in the American Museum,

N. Y., and three others in the Brooklyn Institute as *Eustroma nubilata*, and these show that Hulst's generic reference is correct, but it is a very distinct species and has nothing to do with *immanata*. The name *atrifasciata* is omitted from the index in Dyar's Catalogue and this coupled with the fact that it does not appear as a *Cleora* led Dr. Holland to conclude that the reference was overlooked (Moth Book, p. 344).

Mesoleuca ethela Hulst (Trans. Am. Ent. Soc., xxiii, 283, 1896).

It has been suggested that this species is a form of *M. hersiliata* Gn. Of the many forms of this latter species that I have seen none approached in coloration the peculiar combination displayed in *ethela*. Besides the type there is another identical specimen, also from Sierra Nevada, California, in the Edward's collection in the American Museum. The perfectly immaculate, pale yellow subbasal area is singular, and there are other points which if they prove constant in *ethela* will hold the species abundantly distinct from *hersiliata*.

Mesoleuca abacta Hulst (Can. Ent., xxx, 117, 1898).

I believe that this will eventually fall before *Hydriomena reflata* Grt. I have only the type of the former before me and a specimen of the latter, which I have identified from the description, and while they represent respectively a light and dark form the delineations and structural characteristics are precisely alike. The species is best referable to *Hydriomena*.

Hydriomena occideus Hulst.

The receipt of additional specimens of this species has convinced me that Dr. Dyar is right in referring it as a synonym of *curvilinea* Hulst.

Hydriomena grandiosa Hulst (Can. Ent., xxx. 118, 1898).

The male type at New Brunswick is the same as *Mesoleuca implicata* Gn., and Dr. Dyar tells me that the female type in the National Museum though larger and looking rather different from *implicata* is nevertheless probably that species. I think it is quite safe to say that both names apply to the same thing. The species is almost intermediate in structure between *Hydriomena* and *Mesoleuca*, but is probably best referable to *Hydriomena*.

Petrophora volucer Hulst (Trans. Am. Ent. Soc., xxiii, 293, 1896).

One female type of this very interesting species is in the Hulst collection, and is the same as *Cœnocalpe morrisata* Hulst described almost ten years earlier as a *Marmopteryx* (Ent. Am., ii, 190, 1887). The specific name *morrisata* should be referred to *Petrophora*, which is the correct genus for the species with *volucer* as a synonym. I have other specimens from Stockton, Utah (Spalding) and Doble, California.

Petrophora spaldingaria n. sp.

Expanse 28 mm. Palpi, head and thorax with mixed brown and cream-colored scales, the brown ones predominating on the head, the cream-colored ones on the thorax. Abdomen almost uniform cream colored. Ground color of both wings light cream colored, with brown scales scattered over the surface, rather profusely on the primaries, much less so on the secondaries. Primaries with costal edge almost straight, outer edge also only slightly curved. The veins are faintly yellowish, especially in the centre of the wing and in outer area and particularly near the apex. Basal line not far out from insertion of wing into thorax, brown, strongly but evenly outcurved. Intradiscal line brown, begins on costa over one-third out, runs almost straight toward center of wing to discal cell, then twice dentate to fold through middle of cell $Cu._2$, and strongly bent inward to inner margin, ending one-third the length of this margin out from base. Extradiscal line less than one-third in from apex, twice strongly waved outwardly to $Cu._1$, then far inward and outward again to inner margin, being drawn in acutely on $Cu._2$ and on fold, then roundly scalloped to inner margin. Subterminal line almost parallel with outer margin as a rather faint shade line, scalloped externally and becoming diffused internally, the second scallop from costa being dark and appearing as a brown apical spot. Terminal line brown, broken so as to form small spots on each side of the veins. Basal and median areas much darker, that is, much more heavily strewn with brown scales, than the sub-basal and outer areas. Discal spot brown, linear, fused into the extradiscal line by a deep brown shading and followed outwardly by a rather clear space of ground color which is bordered externally by a faint indication of a median line. Fringe concolorous with wing. Secondaries with only a slight scattering of small brown scales, most apparent on outer half of wing. A single brown line, broad and diffused at the edges, crosses the center of the wing; this extends outward from costa, where it is weakest, and runs with several waves to inner margin. Terminal line as in forewings but poorly marked. Discal spot so minute as to be almost indiscernible. Beneath: the wings are pale, the basal portion of forewings dusky, and the extradiscal line as well as the transverse line of hindwings are broad and diffused. Discal spots small, linear, distinct.

Hab.—Stockton, Utah, October 9, 1902 (Spalding).

Type.—One male in my cabinet.

Scelolophia formosa Hulst (Trans. Am. Ent. Soc., xxiii, 301, 1896).

This is the same as Grote's *Acidalia purpurissata* (Can. Ent., iii, 103, 1871), which was erroneously referred by Packard (Mono., p.

336) to *Acidalia* (*Cosymbia*) *pannaria* Gn. and illustrated on plate 10, fig. 53. Hulst's genus erected for this species is apparently a good one, so the species will hereafter be known as *Scelolophia purpurissata* Grt. with *formosa* Hulst as a synonym.

Eois pallida Hulst (Trans. Am. Ent. Soc., xxiii, 306, 1896).

I think, with a series of specimens, this will be found to be a light form of *Eois nimbicolor* Hulst, in which the transverse lines are somewhat more denticulate; but until more material is available for study it will probably be best to keep them as separate species. *Pallida* was described from Texas, but there is a specimen from Middlesex County, N. J., in the collection as *nimbicolor* that is precisely like it.

Eois volucrata Hulst (Ent. Am., ii, 185, 1887).

This species, described from a single specimen, is a male of *Xytrota hepaticaria* Gn. (Spec. Gen., Phal., i, 471, 1857), and clearly shows the characteristics of the genus which Hulst erected for Guenée's species.

Cymatophora sericeata Hulst.

In the Ent. News, xviii, 149, I made this a synonym of *Selidosema correllatum* Hulst, and in the same journal and volume, p. 295, Dr. Dyar casts a doubt upon this conclusion on the strength of a third type in the National Museum. Upon request, Dr. Dyar has kindly sent me a specimen which agrees with the type at Washington, and from this it is immediately seen that it is a distinct species and that of the types of *sericeata* at New Brunswick, one which I had taken for a much abraded example of *correllatum* is conspecific with it. The other type, however, is *correllatum*. *Sericeata* by the character of the antennæ is referable to *Selidosema*. *S. albescens* Gross. is distinct from *correllatum* as Dr. Dyar now admits.

Æthyctera Hulst (Trans. Am. Ent. Soc., xxiii, 339, 1896).

The type *electa* Hulst is a specimen of *Deilinea falcataria* Pack., and thus both the species and genus fall. *Lineata* Hulst (Can. Ent., xxx, 192, 1892) listed with *electa* under *Æthyctera* is represented in the Hulst collection by a false type. Just where the true type of *lineata* is located and to which if any present genus it is referable I am at this moment unable to say.

Tornos abjectarius Hulst (Ent. Am., ii, 192, 1887).

This was originally described as a dark variety of *Tornos rubiginosus* Morr. = *scolopacinaria* Gn., but in Dyar's Catalogue it appears as a distinct species. A rather long series of specimens shows it to be simply the male of *scolopacinaria*, and indeed Guenée in his description refers to the male as being reddish-brown, while he speaks of the female as being yellowish-testaceous; furthermore, *rubiginosus*, long since placed by Hulst himself (Ent. Am., iii, 11, 1887) as a synonym *scolopacinaria* appears to be *abjectarius*. Abbot also figures both sexes as well as the larva on "*Coreopsis* [*Primula*] *auriculata* or probably *grandiflora*," and from this Packard secured his illustration of the larva on plate 13, fig. 3, of his Monograph. In the text he also speaks of the variation in color of the adults, but he does not apply the two colors to the different sexes. Of my thirty specimens fifteen are pale yellow females, thirteen are brown males, while two males are intermediate between the extremes.

This species is apparently common in Texas, and extends northward to Kansas and Missouri and eastward to Alabama and Florida.

Selidosema delicatum Hulst (Can. Ent., xxx, 106, 1900).

This was described from a male and a supposed female. The former is not in my possession, bus is evidently a distinct species and being a male is probably also correctly referred to *Selidosema*. The supposed female type is before me, but instead of being a female of *delicatum* it is a male of *Stergamatœa inornata* Hulst. The description of *Stergamatœa* is from a female only, so I append a generic diagnosis of the male.

Palpi abruptly upturned, closely appressed to the head and extending a little beyond the somewhat projecting front; tongue well developed; antennæ simple, filiform; thorax hairs, the patagia produced into tufts of fine long hairs much as in *Spodolepis;* abdomen smooth; hind tibia slightly thickened, with two pair of spurs and a hair pencil. Venation as in the female.

Cleora formosata Hulst (Trans. Am. Ent. Soc. xxiii, 357, 1896).

This species was described from a single female from Colorado as a *Cleora*, but on the type label Hulst wrote "*Selidosema;*" nevertheless, perhaps, for want of a male, he retains the species in *Cleora* in his portion of Dyar's Catalogue. Male specimens at hand from Stockton, Utah (Spalding), shows it to possess no hair pencil on the posterior tibia, so the species may now with certainty be referred to *Selidosema*.

Ania brehmeata n. sp.

Expanse 30 mm. Outline precisely the same as that of *limbata*. Costa rounded especially at the humerus; apex acute; outer margin with angle at M_3; anal angle rounded. Entire body and wings uniformly clear yellow, between lemon and ochre-yellow in tint; fringe darker. Three transverse light brown lines cross the primaries taking a course almost the same as those in *limbata*. Intradiscal line begins on costa one-third out from base and extends with a strong outward curve to inner margin. This line is not bent at the cell and then almost straight to inner margin as in *limbata*, but is evenly curved throughout. The two extradiscal lines run precisely as in *limbata*. The inner is less strongly indicated than the outer and begins a little outward of the center of the costa where it forms a small blotch, curves strongly outward to M_2, then inward to inner margin and then slightly outcurved again at the fold. The outer line is distinctly sinnate, beginning one-third in from apex, and with a gentle outward curve runs toward the inner line, then diverges from it, extends toward it again and thence runs parallel with it below the fold. The discal spot is a crescentric narrow mark, the convex side facing basally, and the two ends were they continued would meet the inner of the two extradiscal lines and would thus form the broad oval present in *limbata*. The secondaries are completely crossed by a central well-defined curved line, with a faint line preceding it which approaches it at the first median vein, and after diverging and again approaching it runs parallel with it to inner margin. Discal spot shaped as in the forewings and almost forming an oval with part of the inner cross-line. Beneath it is uniform pale, but bright yellow, and the stronger lines of the upper side are reproduced upon it.

Hab.—Cazadero, Sonoma County, Cal., July 18th.

Type.—One female in my collection.

The species is distinguished from *limbata* at a glance by its much larger size and deep yellow color.

I take pleasure in naming this beautiful Geometer after my friend Mr. H. H. Brehme, of Newark, N. J., who has generously given me the specimen.

Euchlæna occantaria Hulst (Ent. News, i, 207, 1886).

This species was described from two females from Nevada. Rev. George W. Taylor on a recent visit to New Brunswick called my attention to the fact that the single type in the Hulst collection is the same as *Euchlæna mollisaria* Hulst (Ent. Am., i, 206, 1886). *Mollisaria* is cited in our lists as a variety of *E. johnsonaria*, but Mr. Taylor in the Check List of British Columbian Lepidoptera raises it to the rank of a species. There is nothing in the description of *occantaria* to indicate that the other type is not conspecific with the one before me.

NOTES ON THE SPECIES OF AMATHES Hbn.

BY JOHN B. SMITH, SC.D.

(Plates IX–X.)

Under the term *Orthosia* Ochs. we have long had in our lists a number of species which divided normally into two groups or series. One of these was robust, large, heavily built, with quadrate thorax like *helva* Grt. The other was much slighter, smaller, with smoother, convex thorax like *ferruginoides* Gn. That these could not remain united has been recognized; but partly because of lack of material and partly because there was doubt as to the identity of some species, matters have been left as they were. In his vol. vi, Sir George F. Hampson unites the slighter species of our "*Orthosia*" with the genus *Amathes* Hbn., and makes it possible to identity and place all our species.

As thus defined *Amathes* Hbn. has the "Proboscis fully developed; palpi obliquely porrect, fringed with long hair in front, the 3rd joint short; frons smooth; eyes large, rounded; antennæ of male typically ciliated; head and thorax clothed with hair only; the tegulæ produced to a dorsal ridge, the pro- and metathorax without distinct crests; abdomen dorsally flattened, with lateral tufts of hair and some rough hair at base but without crests. Forewings with the termen evenly curved." The eyes are naked and the legs are without spinulation or other armature save the normal spurs. As a minor character it may be noted that in all the species the reniform is dusky filled inferiorly.

Within this genus are three sections, two of which contain American species: Section II with antennæ of male minutely serrate, with fasciculate cilia, and Section III with male antennæ ciliate only.

Section I contains no recognized North American species.

Section II contains two species only, both belonging in the series in which the antemedial or t. a. line of primaries is single, and the costal area of the secondaries is pale. *Verberata* is said to have the "frons black at sides," while *bicolorago* is one of those having the "frons concolorous at sides."

Section III contains all the rest of our species, and the table, modified to contain only those forms, reads as follows:

C. Hind wing fuscous, with the veins reddish.....**immaculata.**
D. Hind wings grayish, more or less tinged with fuscous, and with diffused dark subterminal band.
a. Forewing with a black bar from costa at subterminal line...**purpurea.**
b. Forewing without black bar from costa at subterminal line.
*a*1. Forewing with the orbicular figure—of—8-shaped.....**americana.**
b1. Forewing with the orbicular quadrate, open above.....**puta.**
E. Hind wings yellowish-white.
a. Forewing with series of small black spots on inner side of subterminal line.....**ralla.**
b. Forewing without series of small black spots on inner side of subterminal line.
*a*1. Forewing with the markings dark brown.....**inops.**
*b*1. Forewing with the markings pale rufous.....**decipiens.**

Of these species *immaculata* Morr. and *americana* Morr. are autoptically unknown to Sir George. The type of *americana* is in the Tepper collection, and is a poor example of the European *lota;* the type of *immaculata* has disappeared. It should be in the collection at Cambridge according to the statement in Morrison's description; but it is not now to be found, and there is no record of what has become of it. The description leaves a doubt as to whether the species really belongs here.

In arranging the material in my collection it became obvious that there were several new forms involved, and these were characterized as preliminary to a more careful study of some of the structural characters of the series.

On both structure and maculation three series are obvious in the genus, and they are not even closely related, although for convenience they may be held together for the present under one generic name.

The first series is the equivalent of Hampson's Section II, with the male antennæ minutely serrate and fasciculate. This serration is variable in the species, never very strongly marked, and the fasciculation is as diverse, leaving a very small margin between the series I, and some forms of series II. However, in addition to this antennal character, all the species have trigonate primaries with arched costa, distinct apices and obliquely arcuate primaries on which the s. t. line is continuous and preceded by a darker shading; characters which are obvious in both sexes.

The males of all the species further agree in genitalic structure. The supra-anal plate is of the usual triangular form, and the uncus is a long, simple curved hook of the usual type. The harpes are elongate, of moderate width, and drawn to a rather long point. Along the upper margin they are thickened, and at or behind the middle the corneous clasper is attached. This clasper is rather short, stout, and divided into two forks or branches of which the interior is somewhat hood-like, with a serrate extremity, while the exterior, lying next to the harpes, is more or less spatulate, drawn out and flattened. Within the limits of this series the agreement is close and the species form a thoroughly natural little group.

Verberata Smith is the darkest, and, in a way, the best marked species. The ground color is a sordid luteous, more or less tinged with reddish, mottled and blotched with smoky, and with a very conspicuous, angulated median shade. The dull smoky secondaries with broad costal and narrow exterior yellow margins are alike in both sexes. The black color at sides of front noted by Sir George Hampson is really only a small margin in front of the eyes; but it is present and is characteristic.

Bicolorago Guenée, with its more usual form *ferruginoides* Gn., has a much lighter, more rusty yellowish ground color, the wings seeming altogether more thinly scaled. The maculation is all broken up and the shadings are purplish. The tendency is to darken the entire outer half of the wing; the extreme is this direction being the typical though rather more exceptional *bicolorago*, while the more common type in which the shadings are reduced to the broken up lines is *ferruginoides*. The median shade is rarely conspicuous in itself, and is not strongly angulated over the inferior half of the reniform. The secondaries are very like those of *verberata*, except that they seem more thinly scaled and the light color is paler, more reddish throughout. This is, perhaps, the most common and widely distributed species of the genus.

Decipiens Grote looks like a large, washed out *ferruginoides* with yellow secondaries. The primaries are without contrasts of any kind, and the maculation is traceable merely.

Acta Smith is a bright species, in which the secondaries are uniformly bright lustrous yellow, almost transparent. The primaries are a little darker in ground color and are marked and mottled with brick-red; sometimes approaching the appearance of *ferruginoides*.

All the markings are distinct, and the median shade, which tends to become prominent, is very much like that of *verberata* in course.

Stramínea Smith is a small species, straw-yellow in appearance, with all the maculation present but not conspicuous. The s. t. space is somewhat darkened by a smoky shading and the reniform is dusky inferiorly, as usual. The secondaries, while they are pale, are dull, with a smoky tinge, and there is a darker outer border.

The second series, with the antennæ of the male ciliate only, is the equivalent of Hampson's Section III; but this contains two series more widely distinct than the difference between the series distinguished on the antennal character alone.

Superficially all of these species, except *inops*, differ from all the preceding in that they have a punctiform s. t. line; and in general that line is preceded on the costa by a distinctly darker patch filling the s. t. space at that point. But that is a somewhat variable character, and while in the series it stands out conspicuously in each species, yet individuals occur in all of them in which the point is obscured.

A series of three species, *antapica*, *purpurea* and *fornica* have the primaries somewhat elongate, with acute apices, even or slightly depressed costa and the outer margin a little excised below the apex. There is a tendency to the darkening of the s. t. space, and the terminal space is concolorous or even a trifle paler.

The sexual characters of the male agree remarkably in the form of harpes and clasper. Only in *purpurea* were the supra-anal plate and uncus examined, and in that species the latter is broad and flattened, altogether unlike the slender hook of the species in the preceding series. The harpes in all the species are narrow, elongate, drawn out to a long point; not so markedly unlike the *bicolorago* type, but even narrower with a longer point. The superior margin of the harpes is thickened at base and to the middle, and then the chitinous thickening extends obliquely across to the inferior margin and may extend almost or quite to the tip. From the oblique thickening and almost at the middle of the part a rather stout, moderately long, curved hook arises, which becomes more slender toward the tip, but ends bluntly. Only in *antapica* does this hook seem to be absent; but I believe that to be due to defective material rather than to a real divergence from its allies. Toward the apex and a little nearer the inferior margin is a chitinous, short, stout,

slightly curved or straight tooth, claw or hook, characteristic for each species, and this is on the line of the oblique chitinous ridge already described.

Antapica Smith is a large, rough, powdery brown species; dull throughout and with smoky, dark secondaries; the costal region paler, however. All the maculation is distinct in this species, the median shade is strongly angulated and distinct, and in almost every case the costal dark patch in the s. t. space is well defined. The excision below apex of primaries is not prominent, nor is that on the secondaries very strongly marked ; but the former is at least readily made out and the latter is obvious. The dark filled reniform is unusually conspicuous in this species.

Purpurea Grote varies from reddish brown, often with a smoky suffusion to creamy luteous; the latter being the variety *crispa* of Harvey. This is the largest of the species and the wing form is most characteristic. The depression of the costal margin of primaries is evident, the apex is almost subfalcate in some examples, and the excision on the outer margin of secondaries is well marked. The surface tint is quite even whatever its color, and while all the markings are present they are not conspicuous. In dark specimens the lines are paler filled, and the veins through the outer part of the wing are pale marked. The s. t. line is pale, continuous, accompanied by a series of black interspaceal dots. In dark examples the pale line is conspicuous and the dots are lost, while in pale individuals the line is scarcely noticeable and only the dots appear to represent it. The secondaries are dusky, the costal margin somewhat paler, and they vary in tint much as do the primaries.

Fornica Smith is a decidedly smaller species tending to brick-red in color, in which the characteristic wing form is hardly obvious, while the agreement in maculation and in essential structure is well marked. The markings are all present but not prominent; and the most conspicuous feature is the dark mark on the costa preceding the s. t. line. The secondaries are pale, transparent reddish, with a smoky clouding, which forms an outer band and discal spot. The s. t. line consists of a series of neat, small, interspaceal dots, without traces of an accompanying line.

The remainder of the species, excluding *inops*, differ from all the preceding species by having the uncus in the male furcate, or divided into two divaricate prongs. These prongs are as long as the

single hook of the *bicolorago* series, and the structure is constant and not confined to this series of species only. The species as a whole are slighter bodied than those of the preceding series; but the differences are so slight that it is difficult to draw the line. The costa of primaries is always arched, and generally the inner margin as well; but *aggressa*, in wing form, is very like *antapica*, except that on the secondaries there is a mere trace of the subapical excision. The harpes of the males vary quite a little; that of *aggressa* resembling the preceding series quite nearly, while that of *ralla* has a series of spinules on the inner side of the tip. All the species agree in having as clasper a long, slender or moderate curved hook.

Aggressa Smith is the palest of the species, and in wing form most like those of the previous series. In fact, taking only the first, superficial impression as controlling, its reference as an ally of *purpurea* is the most natural. It is the palest in color of all the species, and in the terminal space in some examples there is a distinct wash of whitish. The median shade is especially well marked and is nearer to a real band than in any other of the species. The secondaries are dirty gray or even whitish, and, altogether, this is a well defined form. The harpes of the male are drawn to a blunt point from the inferior margin, and there is no spinulation at tip, though there are isolated long bristles at the margin. The clasper is moderate in length, stout, well curved, with a blunt tip.

Euroa Grote is a distinctly redder gray to brownish form, with shorter primaries, which have in the male always, and in the female usually, arched costal and inner margins. In some of the females the reddish-gray predominates, all the maculation is well written, and the appearance is very like that of the preceding species, save for the tendency to a dark terminal space and the reddish shade. In the males this narrow winged paler form does not appear to occur, and there is no difficulty in recognizing it. The secondaries are dirty whitish to smoky, with a pinkish or faint reddish tinge. In the male the harpes are shorter and broader than in its allies, the tip more obtuse and the margins set with longer, stiff bristles. The clasper is very long, more slender than in any other species, and well curved.

Duseata Smith looks at first sight like a smaller, darker *euroa*, in which there is a tendency to a blackish shading; and with males of *euroa* only at hand for superficial comparison, that conclusion would

be justified. But with a series of both sexes for comparison, the difference between the two species becomes obvious. *Duscata* is uniformly smaller, more brown in ground, and more suffused with blackish. The primaries are shorter, broader, and similar in the sexes; the outer margin with not a trace of an incurve below the apex. In the primary characters of the male the difference is emphasized. The harpes are much longer and narrower than in *euroa*, and at the tip there is a small series of spinules directed inwardly. The clasper is shorter and stouter than in *euroa*, but yet of good length and moderately curved.

Ralla Grote and Robinson differs from the others of this series in its rusty yellow color and general resemblance to *ferruginoides*. The shorter, broader primaries and the punctiform s. t. line will differentiate it at once, however, when the male characters cannot be referred to. The uniform yellow secondaries give it a nearer appearance to *acta*, which is of another faunal region. In the male structures this species departs a little from the other species in this series by the oblique fringe of spinules at the tip of the moderately elongate harpes. The clasper is the same curved hook, but shorter, and on the whole stouter in appearance.

Inops Grote is altogether out of place here; but my material is too scant to work out its affinities at present. It resembles a small *ralla* in color and wing form, but has the s. t. line continuous, preceded by a dusky shading, much more even than in the first series. In the genitalia of the male it is different in all points from the other species referred here. As to the uncus I cannot speak, because I have had no material of my own available for dissection. In the harpes we have a composite structure, the clasper being not really separated from it. A horny plate runs through the lower half of the harpes from basal third to the inferior angle at tip, and there it is produced into an irregular serrate process. At about the middle of this plate there is a small, cylindrical, obtusely terminated spur.

There are at least two other allied, undescribed species in collections, but in single specimens and in no condition to form satisfactory types.

As to the species here noted they may be arranged in tabular form as follows :

Antennæ of male serrate and bristle tufted.

Secondaries smoky or dusky in both sexes.

Front black at sides; primaries luteous to reddish; median shade distinctly angulated; transverse maculation well written.....**verberata.**

Front concolorous at sides; primaries rusty yellowish, very powdery; median shade upright; transverse markings broken.....**bicolorago.**

Secondaries yellow or pale in both sexes.

All the maculation obscure; yellowish-red; median shade not conspicuous; size large.....**decipiens.**

All the maculation distinct, well written; yellowish, with brick-red powderings; median shade conspicuous; size moderate.....**acta.**

All maculation traceable only; color straw-yellow; size small.
straminea.

Antennæ of male ciliate only.

Costa of primaries a little depressed at or beyond the middle; apex distinct, outer margin a little excised beneath it; inner margin straight or nearly so; the wing elongate.

Ground color of primaries rough, powdery; median shade conspicuous.

Luteous to rusty brown; secondaries smoky brown; size larger.
antapica.

Ground color of primaries even, not powdery; median shade not conspicuous.

Creamy to dark gray-brown; secondaries dusky; excision below apex in both wings well marked.....**purpurea.**

Reddish to red-brown; secondaries pale, with a glistening reddish tinge; excision below apex in both wings feebly marked.....**fornica.**

Costa and usually the inner margin of primaries arched; outer margin not excised below apex.

S. t. line punctiform.

Gray, brown or red, with dusky powderings and washes.

Pale, creamy gray, with smoky markings; primaries in both sexes narrow.....**aggressa.**

Brown-red, less powdery; primaries narrower in the female...**enroa.**

Smaller, darker, more powdery; primaries more obtuse in both sexes.
duscata.

Rusty yellowish, with purplish powderings; maculation broken..**ralla.**

S. t. line continuous.

Rusty yellowish, rather even in tint; the maculation inconspicuous.
inops.

Amathes verberata Smith.

1904. Smith, Can. Ent., xxxvi, 153. *Orthosia.*

1905. Dod, Can. Ent., xxxvii, 246, *Orthosia.*

1906. Hamps., Cat. Phal. B. M., Noct., vi, 480, pl. 107, f. 1, *Amathes.*

The types were received from Mr. Dod, labelled "Head of Pine Creek, Calgary, Alberta," at various dates after the middle of September. Later, Mr. Dod records the capture of the species in June, from the same locality. Hampson adds Glenwood Springs, Colorado, to the distribution, and I now have specimens in my collection

from Kaslo, British Columbia, taken by Dr. Dyar; Victoria, Vancouver, September 9th, and Miniota, Manitoba, September 1st. There are only single examples from each locality, indicating that it is not exactly common; but they are all very much alike, indicating that there is no very great range in variation. There are several examples from Kaslo in the collection of the United States National Museum.

So far as examination has been made, the sexual tuftings of the male correspond closely with those described for *bicolorago*; but material for destructive study has not been available.

Amathes bicolorago Guenée.

1852. Gn., Spec. Gen., Noct., i, 397, *Xanthia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., iii, 124, var. *ferruginoides.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 66 = *ferruginoides.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 218, *Orthosia.*
1898. Dyar, Proc. Ent. Soc. Wash., iv, 324, larva on maple.
1903. Holl., Moth Book, 217, pl. 26, f. 29, *Orthosia.*
1906. Hamps, Cat. Phal. B. M., Noct., vi, 481, pl. 107, f. 2, *Amathes. spurcata* Wlk.
1857. Wlk., Cat. Brit. Mus. Het., xi, 749, *Xanthia.*
1868. G. and R., Trans. Am. Ent. Soc., iii, 78, pr. syn.
1893. Smith, Bull. 44, U. S. Nat. Mus., 218, *Orthosia.*
1906. Hamps., Cat. Phal. B. M., Noct., vi, 481, pr. syn.
var. *ferruginoides* Guenée.
1852. Gn., Spec. Gen., Noct., i, 398, *Xanthia ferruginea* var.
1868. Bethune, Can. Ent., i, 47 (49), *Xanthia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 124, *Orthosia.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 66, *Xanthia.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 119, *Orthosia.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 218, an var. prec.
1906. Hamps., Cat. Phal. B. M., Noct., vi, 482, *Amathes. bicolorago* ‡ Walker.
1856. Wlk., Cat. Brit. Mus., Het., x, 464, *Xanthia.*
1868. G. and R., Trans. Am. Ent. Soc., iii, 78, pr. syn.

In this species I have under examination a very interesting series of considerably over 200 examples. Besides my own collection, there are more than 70 examples from the U. S. National Museum, which are particularly useful because of the range of localities and because there is a series of seven bred specimens; there is also a series of about a dozen examples from the Museum of the Brooklyn Institute, showing extremes of variation; Mr. O. Buchholz has sent me a large number of examples, spread and unspread from Mani-

toba, which illustrate local range, and with the smaller contributions I have an excellent basis for a study of the species.

First of all, it should be said that the structure of the male genitalia is practically identical throughout. I have examined specimens of each type and from almost every locality, and a series of dry specimens from Cohasset, Mass., furnished a large lot of material which was softened in liquor potassa and from which the genital structures were then dissected out entire. In the corneous parts, clasper and uncus, there is absolutely no perceptible variation; in the harpes, or side pieces which are less chitinized, there occurs a very slight variation in details of outline; but so slight as to be unnoticeable, except on close comparison. The abdominal brush is also identical throughout.

In locality the specimens range from Maine to Texas, to the Mississippi Valley to South Dakota and to Manitoba. I have nothing from the Rocky Mountain region nor from the Pacific Coast. As to dates of capture, they begin in early September, extend through October, and a few examples are marked as taken in May, indicating a form that hibernates in the adult stage.

The range of size is unusual for a Noctuid: the smallest example expands 1.10 inches and is a ♁; the largest expands 1.50 inches and is a ♀, the largest ♂ reaching almost as much, or 1.48 inches.

In ground color the primaries may be anything from a pale luteous to coppery red-brown, and the secondaries range from uniform glistening reddish-yellow to black. Usually the primaries are more or less powdered with black scales; but sometimes they are almost uniform reddish brown, the other extreme coming in when all beyond the median line is black or blackish, making a typical *bicolorago*. In what may be considered the normal form of *ferruginoides*, the primaries are of a tolerably even rusty luteous, with blackish or darker brown powderings, which first become more noticeable over the median shade, making that broader and more diffuse, and then darken the s. t. space to the s. t. line which is thereby relieved and made more prominent. The terminal space is usually not quite so dark as the sub-terminal. As a rule the dark secondaries go with the dark primaries, and all the *bicolorago* that I have seen have the hind wings black. As the primaries become paler the secondaries follow, and a mottled forewing means, usually, a hindwing in which the disc is blackish. In the bred series from

the U. S. National Museum the primaries are in most cases quite uniform, but rather unusually intense brown, and the secondaries are blackish; but the palest specimen is paler throughout, and the only mottled example has the secondaries also mottled. I have attempted to determine whether locality had anything to do with the amount of mottling; but this seems not to be the case. Series caught at one time in one place are apt to be very similar; this is proved by the series from Manitoba, and by the material from Cohasset; but in the U. S. National Museum collection there are 28 examples from one general region in New York State, and the full range of variation is represented in this lot. Thirteen of these examples are from Mr. David Bruce, and while most of them are dark or strongly mottled forms, the more uniform red-brown forms are also represented.

Altogether this is an excellent example of a decidedly variable species, with two well-marked forms connected by a full series of intergrades. Typical *bicolorago* is rare; forms nearly immaculate are also rare; the mottled form in which there is a more or less diffuse median shade and a dusky subterminal space is by all odds the most common.

The large series of dry specimens from Cohasset, to which reference has been made, gave an excellent opportunity for studying the structure of the hair pencil which is attached to the base of the abdomen in the male. The first abdominal segment is dorsal only, and ends at the lateral line of the body where the front margin of the ventral portion of the second abdominal segment joins the thoracic structure. Attached just at the extreme outer edge of this second segment, where it joins the dorsal portion of the first segment is a long strip of chitin, broadening toward the lateral margin and from there produced into a long curved stalk, at the end of which is a round concavo convex disc-like structure. The curvature of this stalk is such that when at rest it lies close along the edge of the first segment. The under or concave side of this disc is set with pittings, and from the margins of these pittings comes a dense mass of very long fine hair, forming a slender pencil, almost half the length of the abdomen. This pencil normally fits into a membraneous pocket which is attached on the inner wall of the abdomen, reaching to the end of the fourth segment. The opening to this pocket is on the lateral line of the second and third segments,

that part of the pocket that lies inside the fourth segment having no opening to the face of the ring. This part is also somewhat curved and a little enlarged, to receive the folded up tip of the pencil. On the second abdominal segment, just above the edge of the slit opening into the pocket, is an elongate flap bordering a depression in which a portion of this pencil lies folded up, and acting as a cover and protector to it. That part of the pencil beneath this flap is quite apt to be darker in color than the rest of it.

Covering the sensory disc, the pedicel and the base of the pencil, is a delicate, elastic membrane, attached for the greatest part to the first abdominal segment and serving as a complete covering to the structure while it lies at rest.

The species is sometimes common locally, and the larva, according to Dr. Dyar, feeds on maple.

Amathes decipiens Grote.

1881. Grt., Bull. U. S. Geol. Surv., vi, 269, *Orthosia.*
1906. Hamps., Cat. Phal. B. M., Noct., vi, 491, pl. 107, f. 10, *Amathes.*

Mr. Grote's type was a female from Northern Indiana, taken in June, and that is the only example now in the British Museum. Hampson was therefore compelled to place the species in the section in which the male had the antennæ ciliate only, by guess. The occurrence of a good male shows a close ally of *bicolorago*, and, indeed, Mr. Grote's comparison with that species or its variety *ferruginoides*, is justified throughout.

A specimen in my own collection is from Elizabeth, New Jersey, taken October 19th, by Mr. S. T. Kemp. I have seen, altogether, only four examples of this species, so it can scarcely be considered common in a territory which is fairly well collected over.

Amathes acta Smith.

1907. Smith, Trans. Am. Ent. Soc., xxxiii, 133, *Orthosia.*

My examples are from Corvalis, Oregon, September to November; Livingston and Corfield, Vancouver, in September; and Pullman, Washington, in October. The species is therefore of the Northern Pacific Coast area, and will probably occur throughout that general region. The species varies a little in depth of color, and it is not improbable that examples of it are in collections as pale forms of *ferruginoides*. Examples are in at least two other collections that I have seen.

Amathes straminea Smith.

1907. Smith, Trans. Am. Ent. Soc., xxxiii, 132, *Orthosia.*

The original description and the preceding notes tell practically all that I know of this species. I have only two males, both from Colorado; the type, a fairly good example from Glenwood Springs, in October; the other a decidedly rubbed specimen without date or other information. I am not aware that I have seen others in collections that I have recently looked over.

Amathes antapica Smith.

1907. Smith, Trans. Am. Ent. Soc., xxxiii, 134, *Orthosia.*

This is a very distinct and characteristic species, probably not uncommon and with a considerable range of variation. I have it from Corvallis, Oregon; Pullman, Washington; and Corfield, Vancouver; the dates ranging from the end of September to the middle of November. It is an ally of the *crispa* form of *purpurea;* but altogether a rougher more coarsely powdery species. The range of distribution is like that of *acta,* and the difference between the punctiform s. t. line of this species as compared to the continuous line of *acta* is almost like that obtaining in the east between *ferruginoides* and *ralla.*

Amathes purpurea Grote.

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 125, *Orthosia.*
1898. Dyar, Proc. Ent. Soc. Wash., iv, 323, larva.
1904. Dyar, Proc. U. S. Nat. Mus., xxvii, 873, larva.
1906. Hamps., Cat. Phal. B. M., Noct., vi, 489, pl. 107, f. 6, *Amathes.*
var. *crispa* Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., ii, 276, *Orthosia.*
1881. Butler, Papilio, i, 169, *Orthosia.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 217, pr. var.
1906. Hamps., Cat. Phal. B. M., Noct., vi, 489, ab. prec.

The base of my knowledge of this species is a nice series of specimens in the collection of the U. S. National Museum, in which both the *purpurea* and *crispa* forms are represented. The range of variation is considerable, and greater than is indicated in the original types of the species; but I believe Sir George Hampson has extended it to include the species that I have separated off as *antapica.* In the catalogue above cited, the localities Vancouver and Oregon almost undoubtedly apply to *antapica,* while the California localities only are really applicable to *purpurea* and are from the type examples. I have no doubt whatever of the distinctness of the two spe-

cies that I have separated here, and from the material known to me and from the general run of geographical distribution I doubt whether the true *purpurea* or *crispa* occur in the Vancouver faunal area and that *antapica* runs down to Sauzalito.

A comparison of the figures of the ♂ genitalia will show at once sufficient differences not due to variability, to enhance the superficial characters referred to. Not only are the harpes materially different in outline ; but the form of the small accessory clasper is altogether different in the two species.

Dr. Dyar has bred this species and has described the larva from Alameda Co., California, as feeding on hollyhock and plantain.

Except this, only the type localities are known and the dates are October and November.

Amathes fornica Smith.

1907. Smith, Trans. Am. Ent. Soc., xxxiii, 134, *Orthosia*.

I have only a single example of this species. Fortunately it is a male and in good condition, so that its relationships are apparent. It is tagged with the old "S. Cal." locality label, and I have absolutely no present guide as to its original source. It has evidently been respread since I had it, and if it ever had any distinctive label it has disappeared. In appearance and color it is much closer to *antapica* than to *purpurea*, but is smaller, smoother and more neatly marked. In genital structure the relation to *antapica* is equally clear and the difference is rather in details than in character. I do not consider it beyond the bounds of probability that this is a dwarfed aberrant *antapica* with an erroneous locality ; but I do not believe it to be so.

Amathes aggressa Smith.

1907. Smith, Trans. Am. Ent. Soc., xxxiii, 135, *Orthosia*.

This looks not unlike a faded *eurora* and is probably in collections under that name. I have it from Cartwright, Manitoba, without date, taken by Mr. Heath ; from Chimney Gulch near Denver, Colorado, in July, taken by Mr. Oslar, and from Clear Creek Canon, Colorado, in August, through Dr. Barnes. The wing form is almost elongate enough to justify association with *purpurea ;* but the fascies which is so easily recognized and so difficult to describe suggests *euroa* even more strongly, and that is borne out by the genital structure, which has been already described.

Amathes euroa G. and R.

1873. G. and R., Trans. Am. Ent. Soc., iv, 431. *Xanthia.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 218, *Orthosia.*
puta || G. and R.
1868. G. and R., Trans. Am. Ent. Soc., i, 347, pl. 7, f. 50, *Xanthia.*
1873. G. and R., Trans. Am. Ent. Soc., iv, 431, n. b. 1.
1906. Hamps., Cat Phal. B. M., Noct., vi, 490, pl. 107, f. 7, *Amathes.*

Hampson uses the term *puta* for this species, and does not recognsze the change made by Grote and Robinson because their term first proposed was pre-occupied. If *puta* was actually a *nomen bis lectum* in *Xanthia* when proposed, irrespective of whether it was actually congeneric with the pre-existing *puta*, the authors had a right to change the specific name, and having properly done so they must be followed, even though the two *puta* prove later to be generically separable.

In the series before me there is a curious dimorphism in the females; some of them have the wing form of the male and resemble it closely in maculation; others differ in having the primaries distinctly longer and much more definitely marked, the median shade especially being very well defined and obviously angulated. It really looks very much like *aggressa*. I have never seen a male of this form and it seems locally so uniformly associated with the normal male of *euroa* that I can scarcely believe it distinct. The character used by Hampson in his table, *i. e.*, the quadrate orbicular open to the costa is not constant, a closed oval being about as frequently present as the open quadrate form. I have had the specimens from Mrs. C. H. Fernald's collection, from the collection of the U. S. Nat. Mus., from the Museum of the Brooklyn Institute, and have examined those in the Amer. Mus. of Natural History.

Localities are St. Catherines, Ontario; Kittery Point and Orono, Maine; Buffalo, Centre and Sharon, New York. Dates range from the middle of August to the middle of September.

Other recorded localities cover the eastern United States west to the Mississippi and southwest to the District of Columbia. Colorada is also included, but that may be based on what I have separated as *aggressa;* and Calgary, Alberta, given by Hampson, almost certainly refers to my *duscata*. Though so widely distributed, I have never known the species to be common, and it is distinctly northern in range, more examples in collections coming from "Maine" than from any other one locality.

The sexual characteristics are elsewhere described.

Amathes duscata Smith.

1907. Smith, Ann. N. Y. Ac. Sci., p. —, *Orthosia.*

I have quite a series of specimens from various localities in Manitoba—Brandon, Miniota, Winnipeg, Cartwright—and there are many more in other collections under the name *eurca.* For the latter determination I am responsible in most cases, because until I had sufficient material to compare series, I believed this form to be at most a local race.

Dates of capture are June, August, September and October, and a question remains whether the adult hibernates as is usual in this genus, or whether there are two broods as indicated by the months given. The period of flight is unusual for a member of this genus.

The genital structure has been sufficiently described elsewhere, and the points in which the species differs from its allies have been brought out.

Amathes ralla Grote and Robinson.

1868. G. and R., Trans. Am. Ent. Soc., i, 346, pl. 7, f. 49, *Xanthia.*
1874. Morr., Proc. Acad. Nat. Sci. Phil., 1874, 66 = *ferruginoides.*
1875. Morr., Can. Ent., vii, 78 = *ferruginoides.*
1875. Lint., Can. Ent., vii, 78, *an bona species.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 217, *Orthosia.*
1906. Hamp., Cat. Phal. B. M. Noct., vi, 490, pl. 107, f. 8, *Amathes.*

Differs obviously from all the other species in the series in the rusty yellow colors of thorax and primaries which gives it that casual resemblance to *ferruginoides* that led Mr. Morrison and some others to claim that it was merely a varietal form.

The characters of maculation, color and male genital structure have been already set out, and in the series before me there is very little variation.

General localities are the eastern and Middle United States; my own examples are from Claremont, N. H., September 2d; Cohasset, Mass., August 13th (Bryant); "New York;" New Brighton, Pa., September 1st (Merrick); Cranberry, North Carolina, in August; the latter example from either Laurent or Wenzel.

Orthosia inops Grt.

1881. Grt., Bull. U. S. Geol. Surv., vi, 270, *Orthosia.*
1906. Hamp., Cat. Phal. B. M. Noct., vi, 490, pl. 107, f. 9, *Amathes.*

This the most local of all the species known to me, all the examples that I have seen having been taken by Dr. R. Thaxter at Kittery Point, Maine, in September. One example to a collection seems to be the rule, except at Cambridge, where there are several in the Thaxter material.

Unfortunately I have not had a male specimen of my own for dissection; such studies as I have been able to make show a genitalic structure utterly out of line with any other species in the genus.

There are in collections a number of examples allied to *inops*, and it may be that some are really forms of that species; but all the specimens—one of them in my own collection—are too poor to serve as safe bases for new names.

Orthosia americana Morr., has been already referred to *O. lota* of Europe, and is without much doubt based on a European example. To the courtesy of Prof. R. H. Pettit I owe an opportunity of again examining the type, and after comparing it carefully with authentic examples of *lota*, I do not hesitate to declare it the same.

In 1875, and for some years before and after, there lived in Hoboken, New Jersey, an old collector who had remarkable success in capturing species that no one else seemed to be able to find. For a consideration he was usually willing to part with some of his prizes, and so, gradually, there came into collections a number of specimens without names, all credited to New Jersey, which remained as puzzles for a considerable time. As this collector lived in the outskirts of the city, had a large garden and had plenty of wood and scrub land near by, it was not considered strange that by dilligent collecting he should capture more species than others not so well situated. And when in Sphinges and Bombycids it was found that many of his species were identical with European forms, that was not considered so strange either, because at that time there was a pretty general belief that many of the American species were really the same as those on the other side of the Atlantic. But when it was found that some butterflies purchased from him had been ingeniously stained and tinted, belief in his honesty was shaken, and when it was learned that no one else could find these European species in New Jersey, that label gradually disappeared from the examples or they were entirely discarded. Unfortunately Mr. Morrison got hold of a few of these "uniques" and straightway described them as new. Most of them have been eliminated ere this. A few still have a hold in our lists because direct comparisons have been for some reason impossible. *O. americana* must be omitted hereafter, to be cited only in the synonymy to *O. lota*.

Orthosia immaculata Morr. is included by Hampson with *Amathes;* but can hardly belong here. The description indicates a spe-

cies more like the *conradi* type, and the locality is out of range for any known species of this genus; which is of course no valid argument against such a form occurring there. I have been unable to get track of the type. It is not in the Cambridge Museum as Morrison states, and there is no record apparently, of its ever having been there. It may be that Mr. Morrison failed to return the example after describing it, and later disposed of it elsewhere. Until it turns up or until an insect from Nevada occurs which fills all the requirements of the description, the name must stand "unknown" in our collections.

EXPLANATION OF PLATES.

PLATE IX.

Fig. 1.—*Orthosia crispa*, genitalic structure of male from beneath, with harpe and clasper of one side removed; uncus spatulate.

" 2.—*Orthosia ralla*, genitalic structure of male from beneath, uncus divided, the tips divaricate.

" 3.—*Xanthia flavago*, genitalic structure of male from beneath, with harpe and clasper of one side removed; uncus divided, the tips widely divaricate.

" 4.—*Orthosia ferruginoides*, abdomen of male from beneath showing hair pencils in position.

" 5.—*Orthosia ferruginoides*, part of the inner wall of male abdomen with muscular tissue removed to show the case in which the hair pencil is concealed.

" 6.—*Orthosia ferruginoides*, part of male abdomen from above, with hair pencil partly withdrawn from its case, showing also the openings on the second and third abdominal segments.

" 7.—*Orthosia ferruginoides*, the hair pencil and its pedicel fully separated from the male abdomen.

" 8.—*Orthosia ferruginoides*, disc of the pedicel to which the hair of pencil is attached: very greatly enlarged.

" 9.—*Orthosia ralla*, the hair pencil of male, separated from the abdomen.

PLATE X.

Fig. 1.—Harpe and clasper of male *Orthosia ferruginoides*.

" 2.— " " " " *decipiens*.

" 3.— " " " " *acta*.

" 4.— " " " " *verberata*.

" 5.— " " " " *straminea*.

" 6.— " " " " *antapica*.

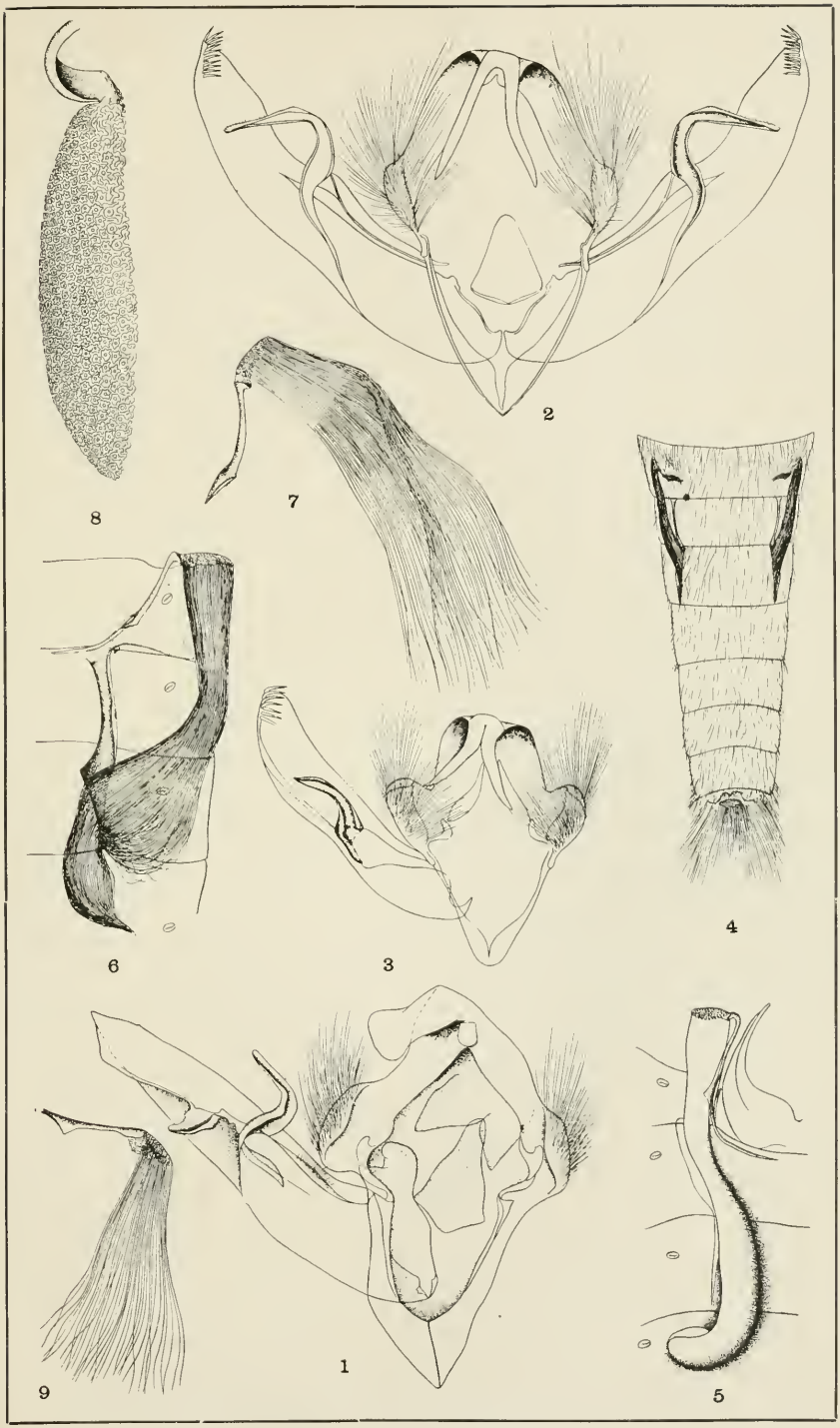
" 7.— " " " " *fornica*.

" 8.— " " " " *aggressa*.

" 9.— " " " " *euroa*.

" 10.— " " " " *duscata*.

" 11.— " " " " *inops*.



SMITH ON LEPIDOPTERA.

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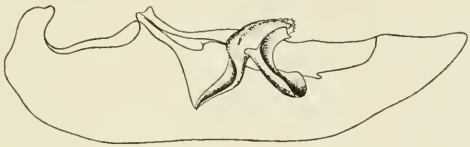

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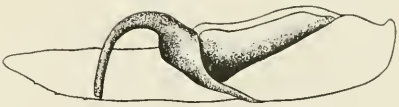

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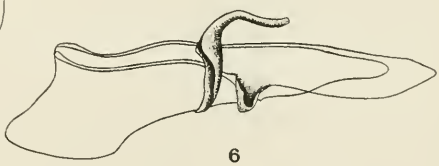

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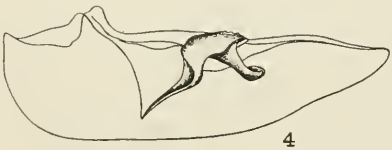

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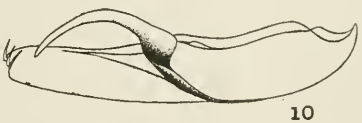


10

SMITH ON LEPIDOPTERA.

Revision of the Species of Pleonectyptera Grt.

BY JOHN B. SMITH, SC. D.

(Plate XI)

This genus was described by Mr. Grote in 1872 (TRANS. AMER. ENT. SOC., iv, 23, and two new species, *geometralis* Grt. and *phalænalis* Grt. were associated with *Hemeroplanis pyralis* Hbn., to make it up. At about the same time, though published a little later, Zeller described his genus *Coptocnemia* in the Verhandlungen de k. k. Zool. bot. Gesellschaft, xxii, 476, and on pl. 1, fig. 19, figured some of the structural peculiarities of his species *floccalis*. The type of that species I saw later, at Cambridge, and found it to be the same as the species identified as *pyralis* by Mr. Grote.

The generic characters are: eyes naked, large, globose, without overhanging ciliæ or lashes. Front normally convex, not specially modified; vestiture hairy and tending to form a little pointed frontal tuft, enhancing the snout-like effect of the palpal structure. Palpi oblique, the second joint longest, clavate, a little flattened transversely, the tip obliquely truncate, but with the angles rounded; terminal joint moderate, cylindrical, obtusely terminated, set into the second joint so as to project straight forward or even to droop a little. Tongue well developed, functional. Antennæ simple in both sexes or with moderate ciliations in the male. Thorax small, convex; collar and patagia not marked, closely appressed; vestiture flattened hair and scales, smooth, forming no tufts. Abdomen cylindrical, elongate, tapering, well extended beyond the hind angles of the secondaries, closely scaled, without dorsal or lateral tuftings. Legs long, slender, unarmed, except for the usual spurs of mid and hind tibiæ, the latter not spinose. In the males the middle or posterior tibiæ may or may not be thickened and provided with sexual tufts, and at the base of the abdomen in the same sex there may or may not be a pair of lateral hair pencils. Wings proportionate, closely scaled; primaries, veins 3, 4, 5 well separated from end of median, 6 almost directly continuing subcostal from the lower angle of accessory cell, 7 and 8 from end of accessory cell, 9 out of 8 near apex, 10 out of upper angle of accessory cell. In the males of some species the subcostal is unusually remote from the costal margin, and

there is on the under side a fringe of fine hair from the costal area extending to the middle of the cell; in others there is a dense tuft below the median vein near its end; secondaries with 3 and 4 from one point at the end of the median, 5 from the cell well removed from 4, but joined to the median by a faint curve, weaker at base than toward margin where it is nearly as strong as the others; in the males of some species there is a flat tuft of hair from the subcostal area near its middle, extending halfway across the cell beneath and there may be also a small hair tuft on vein 5 near its base. In shape the primaries are trigonate, with well defined apices, oblique arcuate outer margin and gently convex inner margin.

The most characteristic feature of the genus is the oblique palpi which extend well beyond the front, apparently straight out in continuation of the frontal tuft, but in reality oblique from the base to the end of the long second joint which is thickened from the upper surface by a massing of scales until the straight or slightly dropping third joint forms a straight line back to the frontal tuft.

The species are generally similar in appearance and maculation, except for *pyralis* and *geometralis*, which are broader winged and with a somewhat different scheme of ornamentation, extending across the secondaries. It is not improbable that some day the genus will be restricted to these two species, and that the balance of the species will be found to be worthy of a distinct generic term.

Pyralis and *geometralis* also differ by secondary characters of the male. This has the posterior tibiæ tufted, thickened and somewhat distorted, and at the base of the abdomen a double hair pencil or tuft. The primaries have an oblique tuft of erect hair extending along the middle of the wing on the under side. In both species the t. p. line is angulated on vein 7, and from that point is evenly oblique to the inner margin. There is an obvious median line and that is parallel with the t. p. line throughout, even to the angulation. The t. p. line is continued across the secondaries and so is the series of s. t. spots.

Pyralis is lemon-yellow to the t. p. line on both wings, and beyond that it is chocolate-brown. At the angulation of the t. p. line on primaries the brown shade does not follow the line but extends to the apex so that there is a continuous, evenly oblique dividing line from apex of primaries to the middle of the inner margin of secondaries on the spread insect.

Geometralis is uniformly chocolate brown, with exactly the same markings as the preceding. Usually the space beyond the t. p. line is a little darker than the basal area, and sometimes there is a distinct yellowish tinge, leading to the belief that after all we have only a well marked race or variety rather than a species distinct from *pyralis*.

Both sexes of both forms occur, however, and my material has not been large enough to warrant me in making the union definitely.

Habitalis, *incusalis* and *reversalis* agree in having the middle tibiæ of male thickened, a little distorted and with a tuft of long hair. In addition, the wings on the underside are provided along the costal vein with fine hair which extends over and partly across the median cell. On the primaries this is rather an even fringe, while on the secondaries it is a narrower, flat tuft, which is triangular in outline and drawn out to a point. There is also a basal hair pencil at each side of the abdomen, similar to that in the preceding species; but the tufts are not quite so conspicuous.

Habitalis has a conspicuous dark reniform, very even pale median lines, and a punctiform s. t. line; the t. p. and s. t. lines tending to extend across the secondaries. It is a small species, almost uniformly luteous red-brown in ground color.

Reversalis is somewhat larger, greenish gray, with olivaceous darker shadings, the median lines dark and diffuse and the reniform not conspicuous. The secondaries are smoky, with the t. p. and s. t. lines traceable. Altogether the species does not in the least resemble the preceding and is not much nearer to the following.

Incusalis is a brightly marked form, varying in ground from yellowish to creamy-gray and even to reddish gray. The median lines are almost always distinct, usually black and shaded with black or brown toward the centre so that occasionally the median space is solidly dark filled. There is every intergrade between the two so that there is room for pretty series. The t. a. line is outwardly oblique, nearly rigid; the t. p. is nearly straight to the middle then sharply incurved so as to leave a usually well defined angle. The reniform is inconspicuous or altogether wanting.

None of the other species have secondary sexual modifications of any kind so far as observed, except that in some the antennæ are more obviously ciliated than in others.

Two species have the median lines rigid, oblique, subparallel, the

t. p. line extending in a straight line from costa to inner margin and vaguely across the secondaries as well.

Parallela is the larger, redder form, with the median lines conspicuously pale, the reniform wanting, and the s. t. line scarcely traceable.

Immaculalis, of which *obliqualis* is a synonym, is small, more yellowish-gray, powdery, with the median lines much less conspicuous, the t. a. tending quite markedly to be only half length, while the linear reniform is always at least traceable. There is an obscure s. t. line which varies greatly in the specimens, but is usually traceable.

Punitalis stands alone in this series by its large size, powdery, luteous red-brown color and general resemblance to *geometralis*. It is the only species here in which the median shade is obvious or even traceable on primaries, and the t. p. line is subangulate on vein 7. The presence of a punctiform orbicular is another point of resemblance to the preceding and different from all the following species.

Rectalis stands alone among the smaller species by its almost obsolescent reniform, very even median lines which are not incepted by black or dark costal spots, and the general almost uniform pale leather-brown color.

All the rest of the species have the reniform well marked or even conspicuous, and the median lines more or less obviously incepted by costal black or dark spots.

Secundalis and *finitima* have the surface of the primaries obviously powdery, the reniform while distinct is not contrasting, and the s. t. line is continuous, preceded by a more or less obvious darker shading.

Secundalis is the larger, more coarsely powdered species, dull gray in color, the median lines diffuse and the veins outwardly dark marked so as to be defined against the ground.

Finitima is smaller, much more variable in ground, ranging from light ashen gray to yellowish and rusty reddish, the median lines not diffuse and the veins not relieved against the ground color anywhere in the wing. The powdering of the primaries, while obvious as compared with the following species is much finer and more even than in *secundalis*.

Of the remaining species, *subflavidalis* resembles *finitima*, except in the lack of surface powdering and in the cleaner cut ornamenta-

tion. The reniform is rarely conspicuous, and the s. t. line is always continuous, irregular, preceded by a darker shade.

Historialis has the reniform conspicuously black, but without a defining ring or mark. The inception of the median lines is not conspicuous; but the lines themselves are complete, very even, the s. t. line obscure and more or less punctiform.

Tenalis looks like a small *historialis*, and has the same contrasting reniform. But the costal spots incepting the median lines are well marked or conspicuous, while the lines themselves are scarcely traceable or altogether obsolete. The s. t. line may be altogether wanting or may be fairly distinct and more or less punctiform.

Pleonectyptera noctuidalis Dyar has nothing to do with this genus, nor does *Cosymbia albocostaliata* which he has recently referred here belong to it, although he is correct in calling it a Noctuid.

In tabular form the species will divide as follows:

Posterior tibiæ of male thickened and tufted; dense tuft on under side of primaries below cell. T. p. line angulated on vein 7, median shade distinct.

Primaries lemon-yellow to the t. p. line, chocolate-brown beyond. **pyralis.**

Primaries uniform chocolate-brown ..... **geometralis.**

Median tibiæ of male thickened and tufted; wings of male with fringes or tufts of hair from costal vein across median cell.

Median lines even, pale; reniform conspicuous ..... **habitalis.**

Median lines dark, t. p. angulated or sinuate; reniform not conspicuous.

Greenish-gray, shaded with olivaceous; lines diffuse; t. p. a little curved over cell, evenly oblique below ..... **reversalis.**

Ashen to yellowish or reddish-gray; lines well defined; t. p. angulated at middle and deeply incurved below ..... **incusalis.**

Legs of the male not modified in any way; no tufts on under side of wings.

Median lines pale, subparallel; t. p. line rigidly even, oblique from costa to inner margin.

Larger; redder; median lines conspicuously pale; reniform absent. **parallela.**

Smaller; yellowish-gray; median lines not conspicuous; reniform linear. **immaculalis.**

Median lines not subparallel; t. p. line more or less angled or outcurved over cell and incurved below, never rigidly oblique from costa.

Orbicular present, punctiform; t. p. line angled on vein 7; median shade line present ..... **punctalis.**

Orbicular wanting; t. p. line not angulate; median shade line absent.

Reniform obsolescent; median lines not incepted by black or dark spots on costa ..... **rectalis.**

Reniform well marked or conspicuous; median lines incepted by dark or black costal spots.

Primaries powdery; reniform not contrasting; s. t. line continuous.
Dull gray, powderings coarse; median lines diffuse; veins outwardly defined by dark scales.....**secundalis.**
Ashen to yellowish or reddish-gray; median lines not diffuse; veins not relieved .....**finitima.**
Primaries even in color, not powdery.
S. t. line continuous, preceded by dark shade; median lines clean cut. **subflavidalis.**
S. t. line wanting or punctiform; reniform conspicuous, black.
Larger; median lines distinct; costal patches not conspicuous. **historialis.**
Smaller; median lines usually lost; costal patches conspicuous. **tenalis.**

Pleonectyptera pyralis Hubner.

1818. Hbn., Zutraege, 1, 23, f. 127, 128, *Hemeroplanis.*
1872. Grt., Trans. Am. Ent. Soc., iv, 23, *Pleonectyptera.*
1880. Grt., Can. Ent., xii, 87, *Pleonectyptera.*
1903. Holland, Moth Book, 246, pl. 29, f. 19, *Pleonectyptera.*
irrecta Walker.
1865. Wlk., Cat. Brit. Mus., Het., xxxiv, 993, *Poaphila.*
1893. Smith, Bull. 44 U. S. Nat. Mus., 362, pr. syn.
floccalis Zell.
1872. Zell., Verh. k. k., Zool.-bot. Ges., xxii, 47, pl. 1, f. 10, *Coptocnemia.*
1891. Smith, List Lepidoptera, 61, pr. syn.
1893. Smith, Bull. 44 U. S. Nat. Mus., 362, pr. syn.

Head and collar chocolate-brown, with intermingled gray-tipped scales. Thorax and abdomen bright yellow, the abdomen with a reddish or brown shading. Primaries yellow to the t. p. line and then beyond that line chocolate-brown, except that at the inward angulation of the line on vein 7, the brown shade continues on obliquely to the apex so as to form an almost even line from apex to outer third of internal margin. T. a. line brown, single, slender, a little outcurved and somewhat irregular in course. Median line distinct, brown, outwardly bent from costa to the reniform, then evenly oblique, parallel with the t. p. line to the middle of the inner margin. T. p. line slender, brown, outwardly oblique to vein 7, then abruptly bent and inwardly oblique to inner margin at outer third. S. t. line punctiform, outwardly marked with leaden gray scales, inwardly shaded with blackish, this in varying amount so as at times to become almost a continuous irregular band. Fringes darker brown. Orbicular small, brown, punctiform. Reniform brown, moderate in size, elliptical, not outlined. Secondaries yellow to a little beyond middle, then brown, continuing the brown shade of primaries obliquely across the wing. Median line of primaries also continued across secondaries at basal third, while the t. p. line crosses just within the brown outer shading. Beneath yellow, with rusty red-brown shades and powderings, both wings crossed by three blackish irregular lines, the outer broadest and inwardly diffuse; the primaries have the orbicular and reniform more distinctly marked than above. Expands 1.12-1.28 inches = 28–32 mm.

Hab.—Long Island to Florida and Texas; New Braunfels, Texas, in June; South Carolina, in June; New Brunswick, New Jersey, in July.

This is the most strikingly marked of all the species and is recognizable at a glance. The palpi differ from those of all save *geometralis* in that the terminal joint is shorter, less cylindrical and practically in line with the second joint instead of being directed forward and at an angle with it.

In the male the underside of the primaries has an oblique patch of somewhat stiff hair extending from the cell toward inner margin, the hair directed outwardly and upturned at its tip. Strictly there are two parts to this patch: one along the median vein directed into the cell; the other crossing the submedian interspace opposite the end of the median vein, the hairs directed outwardly.

The posterior tibiæ of the male are irregularly dilated and excavated or grooved above, and toward base at the inner side of an enlargement a dense tuft or pencil of hair is attached. This structure is concealed by covering hair and scales when in position on the insect so that only a somewhat enlarged tibia is apt to be noted. The subapical spurs of this tibia are slender and weak, and there is apparently only one terminal spur.

At the base of the abdomen is a pair of pencil tufts; the larger and outer white, the smaller and inner blackish or dark brown. The first abdominal segment is composed of the dorsal sclerite only, and terminates abruptly at the sides. Attached to the lateral edges of this segment is a cup-shaped structure which bends around to the ventral surface. The opening of this cup is closed by an operculum of elastic tissue, which, apparently, can be extended and withdrawn at will. At the end of this operculum is a knob shaped structure to which the long hairs that form the outer pencil are attached. This pencil, fully extended, reaches to the end of the third abdominal segment. The groove into which this pencil fits and in which it is normally concealed does not extend much beyond the base of the third segment, so that the tip of the pencil is curved up at the tip when in place. At the base of this outer pencil and inside of its point of attachment is a smaller pencil of finer, dark hair which does not seem to be stalked. It is not recognizable as distinct from the outer tuft until the specimen is examined in liquid or in a very fresh example.

Finally, there is at the end of the abdomen a short retractile brush with round truncate tip, which may be withdrawn into a cavity opening at the end of the 7th abdominal segment beneath.

When extended it forms part of the anal tufting and escapes observation.

The male antennæ are distinctly ciliated and the joints are furnished on each side with long single hairs or ciliæ so that there should be absolutely no difficulty in distinguishing this sex.

Pleonectyptera geometralis Grote.

1872. Grt., Trans. Am. Ent. Soc., iv, 24, *Pleonectyptera.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 362.

Ground color a uniform light chocolate brown. All the markings exactly like those of *pyralis.* Beneath: color and markings identical with those of *pyralis.* Expanse 1.20 inches = 30 mm.

Hab.—Staten Island, N. Y., Lahaway, in August; South Carolina, in June; Florida, in March.

The range of this species is the same as that of *pyralis,* of which I believe it to be a variety. The secondary sexual characters of the male are exactly identical. As both sexes of both forms are at hand, and I have no true intermediate forms, it is perhaps better to keep the species as distinct, until more material makes it possible to settle the question definitely.

Pleonectyptera habitalis Walker.

1859. Wlk., Cat. Brit. Mus., Het., xvi, 39, *Hypena.*
1893. Smith, Bull. 44 U. S. Nat. Mus., 363, *Pleonectyptera.*
phalænalis Grote.
1882. Grt., Trans. Am. Ent. Soc., iv, 24, *Pleonectyptera.*
1893. Smith, Bull. 44, U. S. Nat. Mus., 363, pr. syn.

Leather-brown, varying only a little in depth of color. Head and collar with crimson scales. Primaries crimson along the costa. Median lines distinct, yellowish, a brown or crimson reddish line following in the t. a. and preceding in the t. p. line. T. a. line even, rigid, a little inwardly oblique. T. p. line even, oblique from costa to inner margin, almost parallel to t. a. line, with just a little in and outcurve below and above cell. S. t. line punctiform, smoky, marked with white scales outwardly. A series of dark terminal lunules which are sometimes scarcely discernible. Reniform of good size, blackish, kidney-shaped, quite well defined. Secondaries yellowish at base, darkening outwardly to or near to the ground color of the primaries. Beneath more yellowish, shaded with crimson, especially along the costal region of primaries and on secondaries. Both wings with a dark discal spot, a more or less complete extra median line and a broken or punctiform s. t. line. Expands .80–.92 inches = 19–23 mm.

Hab.—Texas, Florida, Alabama; Tybee Island, Georgia, July 28th; Tallulah Falls, Georgia, August 7th; "New York."

This species occurs throughout the Southern States not rarely, and into central Texas. The "New York" specimen is in my own

collection, without indication of its original source, and I am by no means ready to vouch for the locality; and yet Long Island might not be an improbable point of occurrence, and southern New Jersey is still more likely to produce it.

There is very little range of variation in the examples before me. There is a little difference in the shade of brown, due somewhat to age and condition and some difference in the distinctness of the median lines; but otherwise they all look very much alike.

In the secondary characters of the male the species is in general accord with the others of its section, save that the wing tufts of the under side are much less marked than described for *incusalis*, which in this respect is selected to illustrate the character; that on vein 5 of the secondaries is practically absent, and on the primaries the clothing is scarcely more prominent than in some species of the later section. The tuft from the costal area of secondaries is distinct and like that of *incusalis*, but smaller. The structure of the median tibiæ is like *incusalis*, though when examined on the set specimen they seem only a little thickened and set with flat covering scales, which in fact conceal the tuft and excavation.

The abdominal tufting is characteristic and is figured for the series from this species. There is really a typical stalked pencil tuft concealed in an abdominal groove and a covering tuft attached at the sides of the first abdominal segment, and bent over so as to shield as well as conceal the groove containing the hair pencil. The covering tuft is re-inforced by a membraneous shield inwardly, and it is completely to be moved aside to give freedom to the hair pencil. The first ventral (second actual) segment of the abdomen is a shield-like plate, and under its edges the stalk which carries the pencil is inserted.

The antennæ of the male are ciliated, and the several joints have lateral, longer ciliæ.

Pleonectyptera reversalis n. sp.

Ground color greenish-gray; of primaries a little paler than of head and thorax. Maculation olivaceous. T. a. line rigid, inwardly oblique, well defined toward base, broad, outwardly diffuse. T. p. line yellowish, obscure, preceded by an olivaceous shade line which is inwardly diffuse; in course a little outcurved over cell, and very slightly incurved below. S. t. line broken, but scarcely punctiform; there are two dusky spots below the apex and then from vein 7 the line is continuous, bisinuate, hardly relieved against the s. t. space which is dusky to vein 6 from inner margin, but clearly defined against the terminal space which

is pale, except for an olivaceous clouding at middle. There is a series of dusky terminal lunules from which short interspaceal lines extend inwardly. The reniform is only a little dusky, moderate in size, lunate, not well defined. Secondaries dull yellowish, darker outwardly, with a dusky extra median shade; the outer margin and the abdomen with a coppery tinge. Beneath yellowish, outwardly and costally with coppery-red powdering; primaries with a dusky extra-median and s. t. shade line and discal spot; secondaries with similar but much less marked and incomplete brown lines. Expands 1 inch = 25 mm.

Hab.—Esper Ranch, Brownsvills, Texas.

One male in good condition from the collection of the Brooklyn Institute, taken by Mr. Schaeffer.

The lateral ciliation of the antennæ is much more obvious than in any other of the species, a single long cilia on each side of each joint appearing clearly under the lens, and this character will assist in distinguishing it from all the others. In the olivaceous and greenish-gray color and ornamentation it is also unique thus far. The secondary sexual tuftings of the underside appear to be in all respects like those of *incusalis*, and that applies to the tuftings at the base of the abdomen as well as to those on the wings.

Pleonectyptera incusalis Grote.

1881. Grote, Can. Ent., xiii, 133, *Bomolocha*.

1893. Smith, Bull. 44, U. S. Nat. Mus., 363, *Pleonectyptera*.

Ground color varying from pale gray to pale yellowish, more or less creamy in effect. Sides of palpi scarcely darker. Primaries with the median lines usually black, conspicuous, the t. a. outwardly, the t. p. inwardly diffuse, tending to fill the median space more or less solidly brown or blackish. T. a. line outwardly oblique with a little bend or angle in the submedian interspace, sometimes preceded by a narrow pale or even whitish shade line. T. p. line almost evenly oblique from costa to vein 4, then with a distinct incurve that gives the line a characteristic form; usually there is a narrow whitish or yellow outer edging to this line which merges into the s. t. space. S. t. line altogether wanting or, more usually, defined by a smoky s. t. shading that may be broken or continuous. There may be obvious terminal lunules, but more usually there is no trace of them. Reniform lost or only present as a dusky indication. Secondaries yellowish, a little darker and more brownish outwardly; sometimes with an extra median line. Beneath, pale lemon-yellow, primaries with a small discal spot and an incomplete extramedian line. Expands .95–1.05 inches = 24–26 mm.

Hab.—Arizona, Yuma County, in March and April; Yavapai County, May 2d; Phoenix, April 5th; California, Walters Station, in April; Colorado, without date or specific locality.

A series of seventeen examples, male and female shows a pretty range of variation in color and in the relative contrast of the median lines and space. In the course of the lines there is almost no varia-

tion and these are characteristic for the species. Only *subflavidalis* resembles it in the t. a. line, and none are like it in the course of the t. p. line.

The characters of the male are those of the series to which it belongs, and the abdominal tuftings are as described for *pyralis*. The venation figured is of this species, and the hair tufting is as shown in the picture. At the base of the primaries the tufting is of flattened hair and scales, and forms a little mass at tip; the longer hair from nearer the middle of costal margin is thin, fine and silky and forms a covering or shield over the veins of the costal area. On the secondaries the tuft comes from the membrane between veins 7 and 8, and consists of fine, thin, silky hair, forming two flattened layers; the outer much longer and tapering somewhat to a point. The little tuft on vein 5 is more scale like and lies parallel with the vein when the wing is at rest; it is upright as shown in the figure when the wing is mounted and floats in a liquid medium.

The tufting of the legs is also drawn from this species. The median tibiæ are somewhat inflated and grooved upward and inwardly; this groove concealing a tuft of long fine hair attached at the base. At the edge of this groove is a fringe of short, scale-like hair, which in part serves to close and protect it. The terminal spurs are very unequal. The hind tibiæ are more nearly normal; but there is only a single terminal spur and there is a small hair tuft at basal third.

The antennæ of male have the usual scant pubescence, and in addition each joint has an obvious lateral bristle on each side of each joint; not so distinct as in *reversalis* by any means; but yet readily noted.

The examples from Yuma and Yavapai Counties, Arizona, and from Walters Station, California, were all sent in by Mr. Hutson, and are from similar desert localities. The Colorado locality I know nothing about.

Pleonectyptera parallela n. sp.

Head and thorax reddish or fawn-gray, primaries more reddish. Head and thorax without markings, palpi gray tipped, more reddish basally. Primaries with the median lines almost parallel, rigidly oblique from costa to inner margin, broad, yellow, outwardly bordered by a narrow brown line or shade. There is no appearance of an s. t. line. No orbicular. No obvious reniform; but there is a vague shading at the end of cell which may indicate the occasional presence of this mark. Secondaries shading from pale yellowish at base to the reddish-

gray of primaries at outer margin, the t. p. line of primaries continued across the disc and scarcely less obvious; but this feature is probably variable and the line probably tends to become lost. Beneath: a more intense, almost rusty red, with the outer lines obscurely indicated. Expands 1 inch = 25 mm.

Hab.—Huachuca Mts., Arizona.

Two females, one in excellent condition, the other flown. It is an obvious ally of *immaculalis* Harv., but differs abundantly in the broader median line, the larger size, more robust form and entire absence of the s. t. line.

Pleonectyptera immaculalis Harvey.

1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 13, *Pleonectyptera. obliqualis* Hy. Edwards.

1886. Hy. Edw., Ent. Amer., ii, 171, *Pleonectyptera.*

Pale fawn color above, vermillion tinted beneath. The inner line faint on the primaries, the outer more distinct, pale red, with accompanying pale shade. Dots take the place of the s. t. line. One specimen shows minute superposed points replacing the reniform. Another has a more olivaceous tinting. Outside of the t. p. line the wing shows a faint darker line, and there is everywhere a slight powdering with fuscous.

The above is, in essentials, Dr. Harvey's description, and he allies it to *phalænalis*, differing by the want of the reniform. Mr. Hy. Edwards describes his species as follows:

"Very pale fawn-drab, with a pinkish tinge. The anterior line is discontinued a little beyond the middle, while the posterior is perfectly straight, and goes obliquely to the costa at about 3 mm. from the apex. Both these lines are bright chestnut-brown, though slightly indistinct, the space between them being paler than the rest of the wing. The submarginal line is composed of a broken series of dark brown spots, and there are also brown dots at the ends of the nervules. The secondaries have a faint indication of a median band. Beneath: both wings are stained with reddish, particularly towards the margins and the lower side of the abdomen; tibiæ and tarsi are marked with the same color." Expands .80-.85 inches = 20-21 mm.

Hab.—Texas, March, April, July.

All the specimens that I have seen are from the Belfrage material. The Edwards' type is in the collection of the American Museum of Natural History in New York, and I have examples directly compared with it. In the United States National Museum is a series of specimens out of the type lot from which Dr. Harvey described, and in this series both the Harvey and Edwards descriptions are fully typified. The t. a. line tends to become lost above the middle, and the reniform varies all the way from a narrow line to a pair of dots or is lost altogether.

The males show no apparent secondary sexual characters, and the species is an easily recognizable one by the features just above emphasized.

Pleonectyptera punitalis n. sp.

Ground color a rusty reddish luteous, but ranging from smoky gray to almost leather-brown. Head and collar sometimes leaden or ash-gray. Wings with an irrorate or dusty appearance, giving the effect of a thin sealing. T. a line narrow, single, rusty brown or smoky, a little irregular and a little outcurved. T. p. line rusty or smoky, narrow, obscure, followed by an equally narrow and even less obvious pale line, oblique from costa at outer fourth to form an obtuse angle on vein 7, thence inwardly oblique, a little irregular to inner margin beyond outer third. A vague but usually traceable median shade line extends through nearly the middle of the median space, angulated like and nearly parallel allel with the t. p. line. S. t. line punctiform, spots black or smoky, more or less diffuse, sometimes with a few outer white scales, interspaceal and a little sinuate in the series. Orbicular a small dusky or blackish round dot. Reniform dusky or blackish, small, lunate, always obvious but never contrasting. Fringes concolorous, with sometimes a series of small rusty lunules at base. Secondaries much like the primaries in color, but may be either lighter or darker. Usually there is a traceable darker, narrow extra-median line and a small, vague discal lunule. Beneath: more intensely reddish or leather-brown and more powdery; usually with a trace of the maculation of upper side, sometimes almost immaculate. Expands 1–1.20 inches 25–30 mm.

Hab.—Arizona: Palmerlee, Cochise Co., Sept.; Huachuca Mts., July 30th, August; Yavapai Co., July 19th; Hot Springs, New Mexico, 7000 feet, August; Durango, Colorado, July 8–16th.

Five males and five females in fair condition, and I have seen others in collections. The species was collected by Skinner, Hutson and Schaeffer in recent years, and I found one example in the Hulst collection from New Mexico. It has a general resemblance at first sight to *geometralis*, and with that species I placed my first rubbed examples. The differences, however, are obvious, especially in the male, which lacks all the secondary characters of the older species.

Pleonectyptera rectalis n. sp.

Ground color light leather-brown or reddish over luteous, varying in tint. Primaries without strong contrasts, the median lines only being obvious. T. a. line upright, consisting of a narrow yellowish inner line and a broader, outwardly diffuse brown line which enlarges to a somewhat triangular mark on costa. T. p. line forming a small and very even outcurve over cell and an almost equal incurve below that point; consisting of a well-marked outer yellow line and a slightly broader inner brown line which is a little enlarged on the costa. S. t. line vaguely marked by a slightly darker shade, its course scarcely traceable, but apparently irregular and sinuate rather than angulate or dentate. A

series of very small obscure terminal dots visible in one example. Reniform traceable as a slightly darker indefined mark. Secondaries yellowish at base, becoming reddish outwardly. Beneath: dirty yellowish, costal and outer borders more reddish, with vague transverse indicated shadings in some specimens. Expands .92 inches = 23 mm.

Hab.—Arizona: Cochise Co., July 4th; Baboquavaria Mts., Pima Co., July 15, O. C. Poling; Colorado.

Two males and two females in fair to good condition. The two examples from Cochise Co. belong to the U. S. National Museum and are purchased specimens. The Colorado example is out of the old Hulst collection and has no data as to date, exact locality or collector.

The species is quite readily recognizable by the lack of any strongly marked characters and by the very slightly sinuated t. p. line; both lines starting from very feebly indicated enlargements on the costa.

The male shows no obvious sexual peculiarities on the wings, legs or abdomen; but the antennæ have the segments with longer lateral cilia.

Pleonectyptera secundalis n. sp.

Ground color dull gray, powdered with coarse smoky brown, variable in amount. Sides of palpi dusky. Primaries with all the markings diffuse. T. a. line upright or a little inwardly oblique, edged with yellowish inwardly, outwardly smoky, diffuse. T. p. line only a little curved over the cell, well or even deeply incurved below it; outwardly a narrow yellow line, inwardly smoky, diffuse. The s. t. space is dusky beyond the t. p. line, darkening to the very irregularly angulate and dentate s. t. line which is defined by this dark shading, outwardly emphasized by white scales. Through this s. t. space the veins are obviously dusky and to a smaller extent this occurs also in the paler terminal space. A series of dusky terminal lunules in the interspaces. Reniform a kidney-shaped dark mark without definite outline and not strongly contrasting. Secondaries dirty yellowish from base to a distinct extra-median shade band, beyond which the wing is smoky. Beneath: yellow, more or less powdery; primaries smoky on disk and before the sharply defined s. t. line; also with a smoky extra-median line and a lunate discal mark; secondaries with a narrow median line, a diffuse outer band and a small discal spot. Expands 1.08–1.12 inches = 27–28 mm.

Hab.—Plumas Co., California, May 1st; Los Angeles Co., without date.

Two males and one female; the former good, purchased examples; the later an old rubbed example collected by Mr. Coquillett over 20 years ago and received among a lot of *Bleptina* for determination.

The species is quite characteristic by its powdery surface, the sharply marked and irregular s. t. line and the general resemblance to the Deltoid genus *Bleptina*. There are no apparent secondary sexual characters on the wings or abdomen of the male.

Pleonectyptera finitima Smith.

1893. Smith, Insect Life, v, 333, *Pleonectyptera*.

Ground color gray, with a reddish or yellowish tinge, ranging from ashen to almost brick-red and dull luteous. Palpi brown at sides. Primaries powdery to irrorate with minute darker scales that may tend to smoky or to reddish. Reniform dusky to blackish, contrasting, not outlined, more or less kidney shaped. Median lines double, consisting of a yellowish and a darker line, the latter from a trigonate costal patch following in the t. a. and preceding in the t. p. lines. T. a. line upright or a little oblique, rigid, even. T. p. line a little outcurved over cell and a little incurved below; the curves about equalling each other and a little variable in extent. Usually the wing is darker beyond the t. p. line, but it may extend absolutely concolorous to the outer margin. S. t. line irregular, punctiform, the points sometimes outwardly emphasized by white scales, a darker shade often connecting them more or less completely. A series of dark terminal lunules which may be quite distinct or scarcely traceable. Secondaries from pale smoky or yellowish at base to a lighter shade of the primaries at outer margin, with or without a traceable extra-median line. Beneath: pale, powdered with reddish, varying in tint and in amount until some examples are uniform powdery brick-red. Usually there is a distinct discal spot, an extra-median line and sometimes an s. t. shade; but any one of these may be missing on primaries and on secondaries all may be absent. Expands .88-1.05 inches = 22-26 mm.

Hab.—California: March 21st; Los Angeles Co., July and October; Argus Mts., April; Pasadena, June 20th; Plumas Co., May 1st. Claremont, Colorado, without date or specific locality.

This seems to be among the more common forms and is quite widely distributed. The powdery appearance is characteristic and identifies the species in all its forms. The range of variation is in the relative distinctness of the marks, lines and spots and in the color of the suffusion. There is also a greater range in size than is usual in the species of this genus. There are no obvious tuftings on the wings, legs or abdomen of the male, and the antennæ are but feebly fringed with just noticeably longer hairs on each side of each joint, and these indeed are scarcely to be made out in some examples.

In the series before me four males and eight females are represented; two or more examples having been also used up to make slides illustrating venation, etc.

Types of the species are in the U. S. National Museum and in my own collection.

Pleonectyptera subflavidalis Grt.

1881. Grote, Papilio, i, 166, *Megachyta.*

1893. Smith, Bull 44, U. S. Nat Mus., 363, *Pleonectyptera.*

Ground color creamy gray, with a more yellowish tinge in primaries. Median lines incepted from trigonate blackish spots. T. a. line outwardly oblique, with a slight incurve, consisting of a paler inner and a darker, smoky and yellow outer portion, the latter out of the costal spot. T. p. line with an even out and equal or greater incurve; consisting of a pale inner portion, which is emphasized by the costal spot and a darker, olivaceous outer portion which tends to shade into the s. t. space, which darkens as it approaches the inner margin and at the s. t. line. S. t. line distinct, irregularly denticulate, with paler scales following the sharp dark edge. A series of small blackish terminal dots. Reniform dusky, obscure, lunate, not defined. Secondaries yellowish at base and to a dark outer shade line, beyond which the outer border is darker. Beneath: yellowish, ranging from almost immaculate to a powdery reddish on which the maculation of upper side is vaguely reproduced. Expands .92–1 inch. = 23–25 mm.

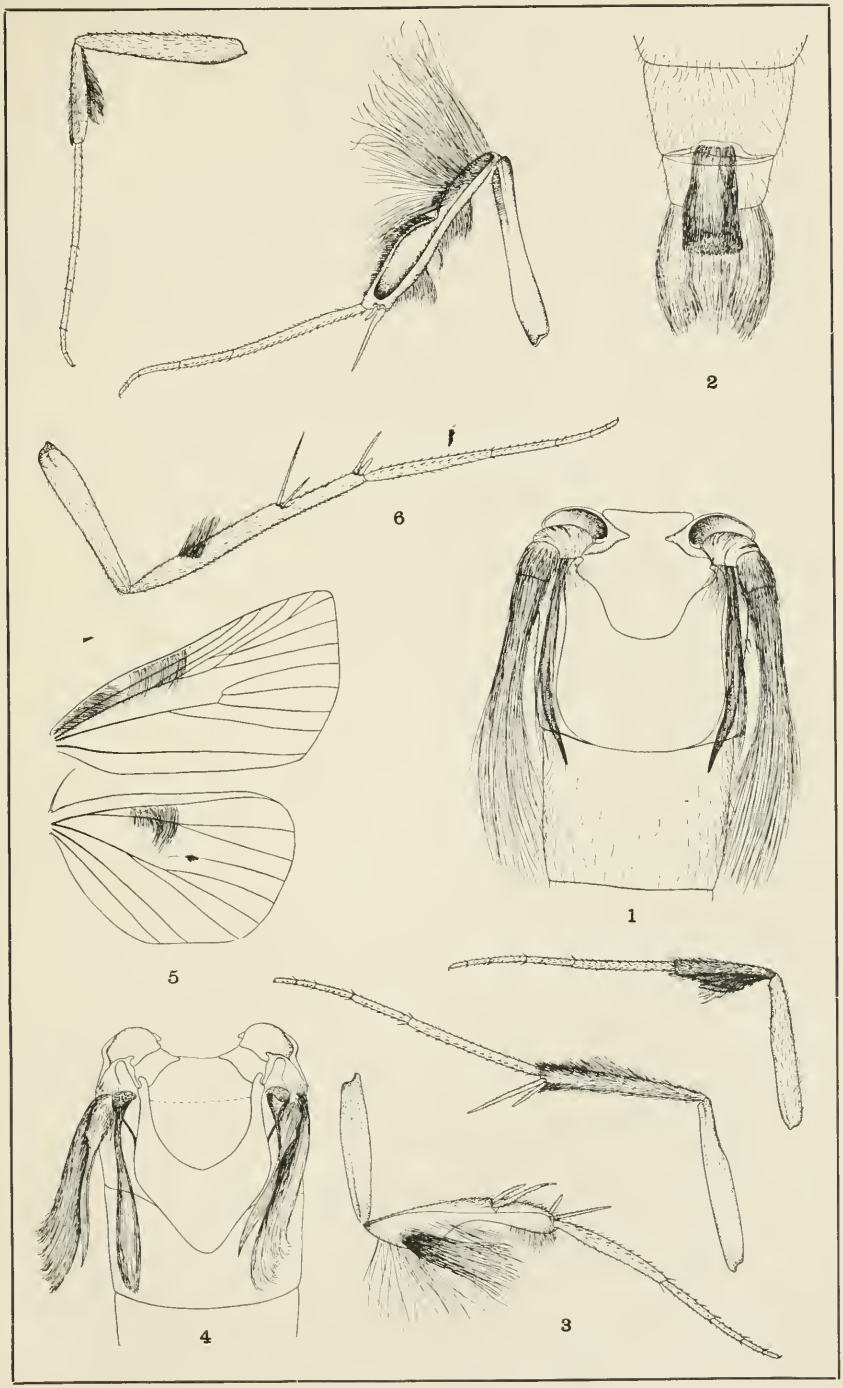
Hab.—Southern Arizona, in May; Claremont, California, without date; Los Angeles Co., California.

The type is in the Neumoegen collection, and I have a good compared pair before me at present. The maculation is almost exactly like *incusalis* in t. a. line; but the t. p. line is not angulate and the reniform is obvious. From *finitima* it is distinct by the course of the t. a. line and by the lack of powdering on the primaries. With the male at hand discrimination is easy, because it lacks the wing and abdominal tufts of *incusalis,* while it differs from that and *finitima* as well by having single longer cilia on each side of each antennal joint. The species occurs within the range of both those with which I have compared it, and it is not improbable that examples are mixed in collections with one or both. It is quite easy to lose a female in either series.

Pleonectyptera historialis Grt.

1882. Grt., Can. Ent., xiv, 188, *Pleonectyptera.*

Ground color pale leather-brown over luteous. Palpi darker brown at sides. Primaries with reniform black, contrasting, of good size, kidney shaped, margins not defined. Median lines quite distinct. T. a. line upright or a little oblique, rigid, consisting of a narrow yellow inner and an equally narrow outer blackish or brown line, the latter from a somewhat enlarged spot on costa. T. p. line only a little sinuate, even, composed of an inner dark line from an enlarged costal spot, and an outer yellowish line; neither very clean cut or contrasting. S. t. line very obscure, marked by a darker s. t. cloud and somewhat irregular. A series of obscure brown terminal lunules. Secondaries pale yellowish or smoky at base, becoming brown toward the outer margin beyond an extra-median dusky line. Beneath: tending to brick-red, powdery, more yellowish at base and along inner margin. Expands 1.05–1.12 inches = 26–28 mm.



SMITH ON LEPIDOPTERA.

Hab.—Huachuca Mountains, Arizona, in August; Yavapai Co., Arizona, May 22d.

The type is in the Neumoegen collection, and I have two females before me that have been directly compared with it. Unfortunately I have no male and I am assuming that this resembles *tenalis*, a species with similar ornamentation but smaller, with less obvious median lines and more conspicuous costal spots.

Pleonectyptera tenalis n. sp.

Ground color an even, very pale reddish-gray; sometimes like a reddish flush over a creamy base. Palpi brown at the sides. Primaries with the reniform black, conspicuous, moderate in size, without sharp defining line. Median lines marked on costa by trigonate blackish marks, and below that barely traceable. So far as can be made out the t. a. line is nearly upright, and the t. p. only a little out and incurved over and below cell. S. t. line may be entirely lost or may be quite obvious, ranging from a series of dusky spots preceded by single white scales to an almost continuous series of spots. Secondaries reddish outwardly over a yellowish base, the latter predominating. Beneath yellowish, shaded with reddish over costal and outer regions, the maculation of upper side obscurely reproduced. Expands .84–.88 inches = 21–22 mm.

Hab.—Arizona: Minnehaha, Yavapai Co., August 2d, 4th and 18th; Yuma Co., Southern Arizona, August 15th.

Two males and four females, of which two, from Southern Arizona, are from Mr. Poling, while others were collected by Mr. Hutson. The species is a very neat little one, like a small *historialis*, with the median lines eliminated. There is little variation, except in the intensity of the reddish and the development of the s. t. line. There are no observable secondary sexual characters in the male and the antennal joints are merely pubescent.

EXPLANATION OF PLATE XI.

Fig. 1.—*Pleonectyptera pyralis*, base of abdomen in the male, showing the characteristic tuftings with the attachments on the first ring.

" 2.—*Pleonectyptera pyralis*, anal tufts and protrusible brush of male. This brush may be completely retracted into the penultimate segment.

" 3.—*Pleonectyptera pyralis*, anterior, middle and posterior legs of male.

" 4.—*Pleonectyptera phalænalis*, base of abdomen of male, showing the characteristic tufts, with their points of attachment.

" 5.—*Pleonectyptera incusalis*, wings of male, showing venation and the characteristic hair tuftings.

" 6.—*Pleonectyptera incusalis*, anterior, middle and posterior legs of male.

NOTES AND DESCRIPTIONS OF HYMENOPTERA FROM THE WESTERN UNITED STATES.

In the collection of the University of Kansas.*

BY H. L. VIERECK, ACAD. NAT. SCI., PHILA., PA.

II.

BOREAL SPECIES.

EUMENIDÆ.

Eumenes (Alpha) marginilineatus n. sp.

♂.—11 mm. Wings brownish, transparent. Otherwise it has the group characteristics of *fraternus* as tabulated in Sausure's American Wasps.

Sculpture and pubescence pretty much the same as in *fraternus*. Thorax a little longer than wide.

Black; clypeus, labrum and tibiæ entirely yellow, a somewhat funnel-shaped mark on the face extending from a trifle above the insertion of the antennæ, the scape in front with a broad stripe, an oblong or nearly oblong mark on head above immediately back of each eye, the anterior margin of the pronotum, a transverse band on the postscutel, and an apical marginal band on each of the abdominal segments, excepting the apical ones and the first ventral, yellow; tips of mandibles and hooks of antennæ brownish-ferruginous, tegulæ partly testaceous, stigma and nervures dark brown. The yellow band at apex of second dorsal segment, deeply angularly emarginate, a yellow spot on each side of the same segment.

Type.—University of Kansas.

Type locality.—Este's Park, Larimer Co., Colorado.

One specimen, taken in July, 1892, by F. H. Snow (U. of K. collection, lot 153).

CRABRONIDÆ.

Crabro (Anothyreus) viciniformis n. sp.

Related to *vicinus*. Metanotum with no strong sulcus, the bands on the dorsum of the abdomen not interrupted.

♀.—9 mm. *Head.*—Dullish, finely sculptured, seemingly impunctate in front, shining, indistinctly punctured behind; anterior margin of clypeus almost straight, not dentate laterally.

Thorax.—Pronotum convex, with hardly any inequalities in its surface; mesonotum sculptured pretty much the same as the posterior aspect of the head; mesopleura with sparser, smaller, distinct punctures compare with the mesonotum; metanotum indistinctly radiately strigate, with its longitudinal median sulcus broad and shallow; the posterior face of the metathorax and its pleura

* Continued from Trans. Amer. Ent. Soc., 1906.

indistinctly roughened and shining, the former with the sulcus of the metanotum prolonged down its middle.

Abdomen.—Shining below, mostly subtle above.

Color.—Mostly black, scape and pronotum entirely yellow, otherwise as in *vicinus* as described by Fox, Crabroninæ of Boreal America.

Type.—University of Kansas.

Type locality.—Base of Humphrey's Peak, 9500 feet, Coconino Co., Arizona.

One specimen, taken in August by F. H. Snow.

ARID TRANSITION SPECIES.

BRACONIDÆ.

Doryctomorpha shoshonea n. sp.

♀.—5 mm. *Head.*—About as long as wide, almost completely dullish and finely, closely, transversely striate; between the insertion of the antennæ and the base of the clypeus there is a somewhat oval, median, longitudinal polished space; the cheeks are partly polished, partly longitudinally striate with striæ similar to those on the face and vertex, occipital region polished; in addition, the head is mostly black, the upper half of the eye being engaged by a brownish testaceous mark on the tegument of the cheeks, vertex and face, the lower fourth of the face brownish to yellowish-testaceous, mandibles brown, tipped with blackish; scape yellowish-testaceous about twice the length of the pedicel which is concolorous with the scape, together these joints are hardly as long as the first joint of the flagel, which last is in turn distinctly longer than the succeeding joint, but decidedly shorter than the next two joints combined, flagel more than 18-jointed, brownish-testaceous, to brownish; joints of the palpi subequal in length, filiform and whitish.

Thorax.—Mostly dullish, black, partly castaneous beneath; pronotum brownish, shining, seemingly sculptureless, almost covered by the forward arching of the mesonotum, which last is divided into three parts by the parapsidal grooves, which are deep and partly somewhat foveate and extend from the anterior to the posterior margin of the segment, the lateral parts of the mesonotum are equal in size and somewhat triangular and granular, the middle part is trapezoidal, occupying nearly all of the anterior edge and the middle third of the posterior edge of the mesonotum, granular on its anterior half and reticulate on its posterior half, the reticulate portion being traversed longitudinally by three rather irregular and equidistant ridges or strongly raised lines; propleura granular, brownish and broadly margined with foveæ on a black surface, the extreme lower margin of this sclerite is somewhat granular and striate; prosternum foveate and brown immediately before the anterior coxæ, anteriorly to the latter area pale yellowish-brown, transversely striate in part and longitudinally impressed; mesopleura granular, with a broad oblique foveate impression extending from the anterior-inferior angle to near the posterior-superior angle of the segment, the latter segment mostly separated from the mesosternum by a deep foveolate furrow; mesosternum mostly shining, inconspicuously granular and bisected by a longitudinal foveate impression; metanotum with most of its space occupied by a rather imperfectly formed diamond-shaped reticulate area extending from base to apex

and between the lateral areas, which latter are more moderately reticulate and twice as broad on the apical half of the metanotum as on the basal half thereof, the areas between the central area and the lateral areas are rather triangular and granular; metapleura reticulate; metathorax dorsally convex; legs pale yellowish-testaceous, tarsi inclining to brownish; wings transparent, tinted with brownish, most of the nervures and the stigma brown; first and second transverse cubiti mostly weak and colorless, costal nervure between the stigma and base of wing yellowish-brown.

Abdomen.—Mostly black, the first two dorsal segments partly castaneous; first dorsal segment wider at apex than at base, which last is about two-thirds half the length of the segment, which is dullish and longitudinally striate, except for a median area, which holds pretty much the same relation to the segment as the median area of the mesonotum bears to that sclerite, but on its basal half it is mostly bounded on each side by a raised line and rather transversely foveate, while on its apical half it is mostly longitudinally striate like the adjoining surface; the second dorsal segment mostly dullish and more finely longitudinally striate than the first segment, but medially the striæ are ill defined and wider apart, with polished surface between them; the third dorsal segment is longitudinally striate only at base, mostly smooth and shining like the rest of the dorsal segments; ovipositor and sheaths dark brown, tipped with blackish and approximately 3.5 mm. long.

Type.—University of Kansas.
Type locality.—Near Lauder, Wyoming.
One specimen.

Dorycles apacheus n. sp.

♂.—7.5 mm. *Head.*—Black and polished, except for the face below the antennæ which has widely separated punctures and is longitudinally divided by an impunctate space which is not as wide as the flagel and which is prolonged above as an impressed line, and the cheeks which have a few scattered punctures, frons transversely impressed with a deeper longitudinal median impression; antennæ black, the scape nearly three times the length of the pedicel but nearly as long as the first joint of the flagel, the latter more than 17-jointed, its joints subequal.

Thorax.—Mostly shining black; pronotum indistinctly sculptured, with a median transverse constriction, the posterior portion being humped; propleura partly polished, punctate, partly rugulose; prosternum polished, sparsely but distinctly punctured, parted anteriorly and posteriorly by a deep impression, the anterior of which is deepest and divided longitudinally by an elevated fold formed apparently by the union of the two sides of the segment, immediately adjoining this fold on each side is a narrow rugose space; mesonotum subtrilobate, the median lobe a little larger than the lateral ones and more strongly convex, slightly longitudinally impressed along the middle of the anterior half and polished with scattered few punctures, the posterior half rugulose, the lateral lobes more uniformly polished and with a few scattered punctures; scutel separated from the mesonotum by an almost smooth, shining transverse band, the scutel proper somewhat arched, indistinctly punctured and sculptured, rather

dullish; mesopleura mostly without sculpture and polished, separated from the sculptureless bisected mesosternum by a deep furrow; mesosternum yellowish-testaceous as is the lower edge of the mesopleura; metathorax ferruginous above, its pleura brown and crudely sculptured and punctured, the metanotum rugulose with a median ill-defined somewhat diamond-shaped area, less than one-third as wide as the metanotum and open behind, wings infuscated or smoky, the nervures and stigma blackish; anterior and middle coxæ and trochanters blackish, the posterior ones reddish.

Abdomen.—Mostly dull orange color, the sutures mostly citron-yellow, dorsal aspect of first dorsal segment about one and one-half times as long as wide at apex, longitudinally striate and separated from the sides by strong carinæ, one on each side; the second dorsal segment nearly three times as wide as long, partly yellow and with a semi-circular radiately striate area on its basal half, the remaining portion of the segment smooth and shining as are the remaining segments.

Type.—University of Kansas.

Type locality.—Fort Apache, Navajo Co., Arizona.

One specimen, taken between August 8-26, 1897, by F. H. Snow.

Doryctes femur-rubrum n. sp.

♀.—8.5 mm.; ovipositor 4.5 mm.—Very like *apacheus* from the description of which it differs as follows:

Head.—Essentially as in *apacheus*, antennæ 56-jointed.

Thorax.—Scutellum proper separated from the mesonotum by an oblong excavation that is longitudinally divided by a ridge and foveate, the scutellum proper shining or polished and sparsely finely punctured; mesosternum and mesopleura posterior to the oblique rugulose impression as well as the metathorax, middle coxæ, posterior coxæ and trochanters, and all but the black tips of the posterior femora more or less ferruginous, metanotum rather distinctly areolate with spiracular, middle pleural, external and external median areas differentiated, the greatest width of the areola about as great as one-third the width of the metanotum.

Abdomen.—Ferruginous, all but dorsal segments 1 and 2 polished, the former rugopunctate, the latter mostly radiately striate, rugose at extreme base.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff in Coconino Co., 5000 ft., Arizona.

One specimen, taken in August by F. H. Snow.

Iphiaulax triangulifera n. sp.

Third, fourth and fifth dorsal abdominal segments rugose. ♀.—6.5 mm. *Head.*—Black, antennæ blackish-brown; mostly as in *militaris*, but the scape shining, nearly twice as thick as the flagellum in the middle, its margins produced, sublaminate, pedicel about one-third as long as the scape, about two-thirds the length of the first joint of the flagel, flagel over 44-jointed, its joints subequal.

Thorax.—Smooth and polished, seemingly sculptureless, pro- and mesopleura

each with an oblique channel, the latter seemingly separated from the former by another oblique channel; a longitudinal channel separating the metanotum from the metapleura; parapsidal grooves almost wanting, indicated only by the merest impression of the tegument; ferruginous, the legs and a stain on each side of the mesonotum black; wings transparent, but strongly brown, the nervures and stigma a darker brown than the membrane.

Abdomen.—Ferruginous, tipped with blackish, shining; first and second dorsal segments more or less reticulated and as in *militaris*, the triangular area of the second segment, however, with its apex attaining the apical margin of the segment; ovipositor 5 mm. long, of the same color as the flagel.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 6000 ft., Oak Creek Canon, 20 miles southwest of Flagstaff, in Coconino, Arizona.

One specimen taken in August by F. H. Snow.

ICHNEUMONIDÆ.

Syndipnus erythrogaster n. sp.

♂.—9 mm. *Head.*—Shining, minutely indistinctly punctured, covered with short, silvery, inconspicuous pubescence; the face below the antennæ almost entirely yellow, the yellow extending up on the front along the eye margin, the rest of the front black, a brown arcuate band extending from eye to eye and skirting the posterior ocelli, back of which the vertex and upper part of cheeks are black like the occiput; cheeks mostly pale brown; malar space yellow; mandibles yellow, tipped with brown; scape, pedicel and first joint of flagel more or less yellow beneath, blackish-brown above, the second, third and fourth joints of the flagel brownish or blackish-yellow beneath, blackish above, the first flagellar joint about as long as the combined length of the next two, the scape somewhat oviform, nearly twice as thick as the pedicel and nearly three times as long as the latter; clypeus not separated from face, about as wide as the eye, truncate; upper half of face below antennæ with a median longitudinal slight eminence; palpi whitish.

Thorax.—In sculpture and pubescence about the same as the head; dorsulum practically not at all impressed, and brown, excepting its edge laterally and posteriorly; pronotum inconspicuous, black, its pleura roughened, black and brown, with the tubercle yellow; scutellum mostly brown; other parts black, with or without brown stains; metathorax with only the median longitudinal and apical transverse carinæ on the dorsal and posterior aspects, but these are strongly developed, the former forming a nearly oblong area and the latter an almost crescentic area, which latter is longitudinally bisected by a carina; coxæ and trochanters of middle legs and trochanters of posterior legs almost entirely yellow, the remainder of the anterior and middle legs, excepting tips of terminal tarsal joint, claws and pulvilli which are brown, pale testaceous, posterior coxæ black, with yellowish tip, posterior femora blackish and brown, basal two-thirds of posterior tibiæ pale brown, the apical third blackish, the first, second, third and fourth joints of the posterior tarsi yellow to yellowish, with a brownish tint, the apical joint brown, but a paler shade than the claws and onychiæ; wings transparent, tinted with brown, nervures and stigma mostly dark brown, tegulæ

yellow, second abcissa of the cubital nervure not much more than half the length of the transverse cubitus.

Abdomen.—Mostly smooth and polished, the first dorsal joint nearly three times as long as wide at apex; the second dorsal segment longer than wide at base and about as long as or a little shorter than wide at apex, the succeeding joints wider than long and rather oblong in outline; ferruginous, tipped with blackish.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 690 ft. elevation, 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

One specimen captured by F. H. Snow in August.

Mutilla (Dasymutilla) apachea n. sp.

♂.—6 mm. *Head.*—Distance between posterior ocelli a little less than that between them and nearest eye margin; face rugopunctate, the rest of the head coarsely punctured and nearly as closely punctured as possible, frons with a median longitudinal impression extending downwasd from the anterior ocellus; entirely black or blackish, with the exception of the eyes, which are rather steel color.

Thorax.—Excepting the metathorax, which is coarsely reticulate, punctured much like the head, same color as the head; beyond the radial, second submarginal and first and second discoidal cells the neuration is faint, shadowlike, wings strongly brown, with a large portion of the basal two-thirds paler than the rest of the wing, stigma and nervures blackish-brown.

Abdomen.—First ventral segment with a blunt obtuse angled median longitudinal keel; the second ventral segment not at all felted, the second dorsal with a felted line parallel to the lateral margin and removed therefrom to about the width of the apical joint of the flagellum, extending the length of the middle two-fourths of the segment; first segment black, sculptured very like the head; the succeeding segments pale brown, not so coarsely punctured as the first; pygidium finely and coarsely roughened, rather oblong and distinctly margined.

Type.—University of Kansas.

Type locality.—Fort Apache, Navajo Co., Arizona. One specimen. August 20, 1897.

EUMENIDÆ.

Eumenes (Alpha) globulosiformis n. sp.

Related to *globulosus*, from which it differs as follows.

♀.—*Head.*—Clypeus rather coarsely striato-punctate, its anterior margin forming an inverted M, with the emargination rightangular; yellow of face confined to a transverse basal bar on the base of the clypeus and another transverse bar between the sockets of the antennæ; the basal lobe on the inner edge of the mandibles about three times as long as high, the apical lobe, *i. e.*, the one before apex of the mandible nearly as high as long.

Thorax.—Convexities of the metathorax strong, the channel separating them rather deep throughout; tegulæ almost completely reddish-brown.

Abdomen.—Apical margin of first and second dorsal segments distinctly swollen, that of the second, the anterior aspect of the swollen portion of the second segment, in the middle, when viewed from the side forming an obtuse angle with the remainder of the segment; punctuation of the first dorsal segment sparse, excepting medially and along the margins; the second dorsal segment conspicuously dullish; apical segment immaculate; venter dullish.

Remarks.—The pubescence is superficially inconspicuous, but on close inspection seen to be fine, abundant, tinted with ochreous and mostly less than 1 mm. in length.

♂.—Excepting the sexual peculiarities essentially like the ♀, clypeus yellow, excepting laterally, and a transverse testaceous mark close to the apex of the emargination; hook of antennæ brown; tibiæ and tarsi entirely dull ferruginous and brown.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

Two specimens taken in August by F. H. Snow.

Eumenes (Pachymenes) bolliformis n. sp.

Related to *bolli*, from which it differs as follows:

♀.—*Head.*—With the following exceptions almost exclusively black: clypeus, excepting an almost central blackish dot and a subapical testaceous mark yellow, an hourglass-shaped supraclypeal mark, scape in front, labrum, and a short postocular line more or less yellowish; clypeus distinctly but not much longer than wide, its anterior margin forming a segment of a circle; greater part of apical third and outer margin of mandibles brown, the teeth about as in *globulosiformis*.

Thorax.—Black, with the exception of the following parts, which are more or less yellow to yellowish-ferruginous: pronotum in the middle and its anterior and posterior margins, tegulæ, a spot on pleura beneath tegulæ, a spot on each side of scutel, postscutel, the greater portion of the superior aspect of the metathorax and all of the legs excepting the coxæ and trochanters; wings nearly as in *globulosus*.

Abdomen.—Dullish; first segment black, except for an apical yellow margin and a yellowish ferruginous spot on each side; the second segment with the basal half mostly black, the apical half mostly yellow, the black portion on the second dorsal segment somewhat hourglass shaped; the normally exposed portion of each of the succeeding segments practically entirely yellow.

E. bolliformis. Natural size.

♂.—Smaller; clypeus rather indistinctly punctured with punctures of two sizes, the large ones rather sparse, no central blackish spot, otherwise nearly as in the ♀; hook of antennæ brown; apical ventral abdominal segment immaculate, apical third of second abdominal segment mostly yellow; a free, nearly oblong yellow mark on each side of the middle third of the second dorsal abdominal segment, the apical yellow band of this last segment triangularly emarginate on its anterior margin.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, in Coconino Co., Arizona.

Collected in August by F. H. Snow.

Two ♀ and three ♂ paratopotypes exhibit the following atypical modifications: ♀, no blackish spot on clypeus; ♂, scutel entirely black; lateral marks of second dorsal abdominal segment not free, the yellow margin of the same segment not emarginate on its anterior edge.

In all the specimens of this species examined, there is a persistent subapical, median rounded or transverse mark on the yellow portion of the second dorsal abdominal segment.

Eumenes (Alpha) cruciferorum n. sp. (Pl. XIII).

Related to *emarginilineatus*.

♀. *Head.*—As in the related species, with the exception of the clypeus which is about as long as wide, with its anterior edge triangularly emarginate, the angle of the emargination being a little greater than a right angle, shining and rather coarsely but not deeply, sparsely punctured, with the middle mark united to a rather circular black mark with a short petiole of black, the rest yellow; labrum brown.

Thorax.—This portion of the insect and its appendages are essentially as in *emarginilineatus*, barring the following points: yellow as follows—a short line on each side of the mesonotum adjoining the posterior edge of the pronotum, a small spot on each side of the scutellum, a spot on the pleura beneath the tegulæ, two spots on each tagula and a ⌐-shaped mark on the anterior and lateral edge of the metanotum, *i. e.* the posterior aspect of the metathorox; the anterior femora are mostly yellow beneath.

Abdomen.—Much as in the related species, the petiole more elongate, three or nearly three times as long as wide at apex, shining, rather deeply and sparsely punctured and with a yellow dot on each side a little beyond the middle; first dorsal segment shining, its punctures about the same as those on dorsum of petiole but closer together, its lateral spots amplified to form an interrupted band which unites with the apical band laterally, giving the black portion of the segment a sort of hour-glass appearance; apical band nonemarginate, a little more than half of the second ventral segment yellow.

♂.—Essentially like the female; clypeus longer than wide, indistinctly punctured, entirely yellow; labrum tipped with yellow; hook of antennæ brown; dorsulum, scutel and metathorax immaculate; apical band of second dorsal segment emarginate, its yellow lateral spots separate, free and elongated into cuneiform marks; second ventral segment with less than half of its surface yellow, the succeeding segments excepting the apical one banded or spotted with yellow; anterior femora only tipped with yellow.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Captured in August by F. H. Snow.

Eumenes (Alpha) enigmatus n. sp. (Pl. XII).

♀.—Differs from *emarginilineatus* as follows: tegulæ partly, a spot beneath latter on pleura, a short band on each side of metathorax, an elongate cuneiform mark on each side of the second dorsal abdominal segment, a cone-shaped mark on first ventral segment, a large helmit-like mark on second ventral segment and a yellow apical line on each of the following segments, except the apical one, yellow. In addition, the convexities of the metathorax are rather hemispherical and the petiole is broader.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Two paratopotypes, one of which has a yellow spot or dot on each side of petiole.

All taken in July and August by F. H. Snow.

Odynerus sulfuritinctus n. sp.

Related to *scutellaris*, from which it can be readily separated by the excavated metathorax, etc.

♀.—13 mm.—*Head.*—Front distinctly punctured, the punctures adjoining and placed in a shining tegument; clypeus and cheeks more shining and with their punctures more separated than the dorsum of the thorax; covered with pubescence varying in color from brownish-gold to yellowish-gold, but nowhere obscuring the tegument; black and yellow, the yellow confined as follows, a line on basal half of mandibles, clypeus excepting the margins of the anterior half and a triangular space in the middle, a spot between the insertion of the antennæ, the anterior aspect of the scape and an ovoid mark back of each eye; vertex with a deep pit posterior to the hind ocellus, giving the appearance of there being an additional simple eye.

Thorax.—Black and yellow, pubescent in much the same way as the head, its pubescence of the same kind; pronotum bordered with yellow along its anterior margin; anterior femora and tibiæ partly yellow, the anterior tarsi almost completely yellow; mesothorax above sculptured much the same as the front and most of the remainder of the thoracic dorsum, its pleura more shining on account of the punctures being more separated; its yellow portions are as follows: a spot immediately posterior to the tubercles on the mesopleura, all excepting the central testaceous portion of the tegulæ, the post scutel, middle and posterior coxæ anteriorly, middle and posterior femora in part, greater portion of its tibiæ and the middle tarsi almost entirely, the posterior tarsi brownish like the hindmost portion of the adjoining tibiæ, wings brownish, with a yellowish reflection, posterior edge of postscutel with a series of short broad rather indistinct teeth;

metathorax shining and transversely striate, presenting a concave surface bisected by a narrow shining smooth space part way down the middle and partly by a somewhat incomplete longitudinal channel, its lateral margins terminating in the middle in a rather acute angled tooth, a yellow mark on each side of its dorsal aspect.

Abdomen.—With its pubescence and color much the same as on the thorax, rather closely punctured, the punctures closer and coarser near the edges of the 2nd-5th segments than elsewhere; first dorsal segment nearly as wide as, but only about half as long as the second, with a faint median longitudinal impression, otherwise uniformly smooth, a broad yellow border along the posterior margin, continued laterally anteriorly and then toward the middle line, the posterior border with a brown line on each side; the second dorsal segment with the apical margin reflexed in much the same way as in *rectangulis*, its ornamentation almost the same in scheme and color as that on the first; the exposed portions of the remaining dorsal segments, the second, third, fourth and fifth ventral segments with an apical sinuate border, and the base of the apical ventral segment yellow.

♂.—10 mm.—Very like the ♀, from which it differs in having the clypeus entirely yellow, in the abscence of yellow marks on the metathorax, in having yellow marks on the anterior coxæ, in the absence of accessory yellow lines to the border of the second dorsal abdominal segment, in the apical ventral segment of the abdomen which is not yellow at base, and in the tibiæ and tarsi which are more brownish than yellow.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Paratopotypes ♀, 1 or 2 mm., smaller than the type ♂, with practically all the anterior half and part of the posterior half of the clypeus black and with the second dorsal abdominal segment ornamented in the same way as the type ♂; ♂ metathorax with yellow marks.

All collected by F. H. Snow.

Odynerus spectabiliformis n. sp.

Very like *spectabilis* in structure. The following description is comparative with reference to Saussure's description in his "American Wasps."

♀.—12 mm.—*Head.*—Clypeus broader than long and pitted with deep distinct well-separated punctures; vertex with a depression back of the middle ocellus; pubescence silvery and golden, but so inconspicuous as to escape superficial observation; black, with the following yellow parts: clypeus, scape anteriorly, a mark between insertion of antennæ, and somewhat above the same another mark between the antennal sockets and the eye margin, and a line on the cheeks and vertex along the posterior eye margin; scape and greater part of flagel behind brown.

Thorax.—Essentially as in *spectabilis;* pubescence the same as on the head and abdomen; mostly black; following parts yellow unless otherwise stated, anterior and posterior margin of pronotum, a spot on each side of scutel, postscutel (tinted with orange), mark on each side of metathorax rather ferruginous, spot beneath tegulæ on pleura sort of orange color as is the nontestaceous portion of the tegulæ and greater part of femora; the following parts are brown: coxæ of middle and posterior legs partly, practically all of tibiæ and tarsi; wings infuscated and brownish.

Abdomen.—Smooth and shining, with distinct well-separated punctures, excepting along the apical margin of the second dorsal segment and on the exposed portions of the third, fourth and fifth dorsal segments where they are very coarse and close, giving them an appearance of rugosities, the apical dorsal segment sparsely, these punctures on a smooth surface, the second, third, fourth and fifth ventral segments uniformly punctured in much the same way as the dorsal segments are at base, the apical ventral segment granular, following portions yellow, a broad apical band on the first dorsal segment prolonged on each side into a yellow mark extending forward laterally, and all of the succeeding segments except at base.

♂.—10 mm.—Essentially like the ♀, differing somewhat in the yellow of the scutel which is reduced to two inconspicuous spots and in the postscutel where the yellow is reduced to two lines.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Arizona.

Collected by F. H. Snow.

Odynerus hidalgiformis n. sp.

Related to *hidalgi*, from which it is readily separated by the more sparsely punctured less deeply canaliculated second abdominal segment. Has the thorax longer than wide showing its affinity to *Stenodynerus.*

♀.—12 mm.—In structure, pubescence and sculpture very like *spectabiformis*, but there is no depression on the vertex, and the posterior surface of the metathorax is bisected by a shining line.

Head.—Black, with the following parts yellow, greater part of clypeus, the blackish portion thereof being confined to the anterior two-thirds, supraclypeal mark extending up to between the antennal sockets, the anterior half of the scape and a spot on each side of the head back of the eyes.

Thorax.—Black, with the succeeding parts yellow, anterior half of pronotum, spot on each side of the thorax beneath the tegulæ, a margin on the tegulæ, a band on postscutel, and a mark on each side of the posterior aspect of the metathorax along the lateral margin.

Abdomen.—Black, mostly ornamented with yellow as follows: the first dorsal segment in such a way as to give the black portion a somewhat hour-glass appearance, an apical band prolonged along the lateral margin and then directed inward toward the median line on the second dorsal segment, an apical band on

each of the succeeding dorsal segments, the apical segment is yellow, excepting the blackish margins, the 2nd-5th ventral segments are margined with yellow laterally and posteriorly, the apical ventral segment with a transverse band.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected by F. H. Snow.

Odynerus canaliculatus n. sp. (Pl. XII).

= *Odynerus iturbidi* Vier., Tr. Ks. Ac. Sci., xx; Tr. Am. Ent. Soc., xxxii.

Differs from *iturbidi* in the apical edge of the second dorsal segment being reflexed practically as in *rectangulis*.

♂.—11 mm.—*Head.*—Clypeus deeply emarginate, bidentate, yellow; hook of antennæ brown; rest of the head black, excepting the triangular yellow supraclypeal mark, yellow to ferruginous mark in emargination of and back of eye and ferruginous pedicel; greater part of first flagellar joint ferruginous as is the posterior aspect of the scape, its anterior aspect being yellow; mandibles black at base and apex, mostly brown.

Thorax.—Metathorax with no dentiform angle on each side but rounded off; pronotum tinted with yellow anteriorly; scutelli only partly ferruginous; middle segment not at all ferruginous; legs to basal third of femora inclusive black, remainder mostly yellow, with part ferruginous.

Abdomen.—First dorsal segment practically impunctate, its venter and anterior face of dorsum black, as is a spear-shaped mark united with the black of the anterior aspect, the remainder of the segment ferruginous, with a yellow then testaceous apical border, the second dorsal segment on the basal half partly like the first and with an obtuse angled triangular black mark, which latter is bounded posteriorly and laterally by ferruginous then by yellow, the yellow extending to the apex of the segment; channel very coarsely punctured and spinose; second ventral segment not channeled, otherwise in color and pattern like the corresponding dorsal segment; the rest of the abdomen mostly yellow and punctured. Otherwise as in *iturbidi*, see Sauss., "Am. Wasps."

Type —University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) tempiferus n. sp. (Pl. XII).

Excepting the length of the thorax, this agrees in size and structure with Saussure's description of *iturbidi*, from which it is very different in color and color pattern.

Head.—Clypeus entirely yellow, a tribolate supraclypeal yellow mark, a yellow mark, a yellow line along the eye margin extending from the clypeus to the apex of the emargination of the eyes, the cheeks with a yellow line along the eye margin, the scape in front and the mandibles almost entirely yellow, the

scape posteriorly, the pedicel and first to third joints of flagel more or less ferruginous to brown, hook partly brown; mouth parts various shades of brown; otherwise black, with golden pubescence.

Thorax.—Mostly black, with golden pubescence, excepting on the dorsulum where it is blackish; pronotum almost entirely brownish to ferruginous to yellowish; tegulæ testaceous and yellow; the subtegular spot mostly yellow; an oblong mark on each side of the scutel and a transverse line on the postscutel, and the superior aspect of metathorax yellowish ferruginous; coxæ in front mostly yellow, black behind, trochanters mostly black, anterior and middle femora yellow and ferruginous, posterior femora black at base, yellow at apex, ferruginous between, tibiæ and tarsi mostly yellow; wings mostly fuscous, especially the marginal cell, the stigma, the costal and subcostal nervures from the stigma to base of wing, the costal cell, median and submedian cells more or less yellow.

Abdomen.—Mostly yellow, or yellowish anterior aspect of first dorsal segment, base of first and second ventral and second dorsal segments and an hourglass-like black mark on first and second dorsal segments black.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August by F. H. Snow.

Odynerus (Stenodynerus) rectangulis n. sp.

Agrees with the description of *toltecus* in Saussure's Am. Wasps, excepting in the following particulars:

Head, thorax and abdomen black, maculated with yellow.

♀.—*Head.*—Clypeus coarsely punctured, some of the punctures confluent, others nearly so; no ferruginous mark at base of antennæ, anterior portion of scape yellow; a yellow band at the posterior margin of the clypeus.

Thorax.—With a yellow mark on each side of the mesonotum at the junction of the wings with the thorax; postscutel not at all carinate transversely; the metathorax broadly excavated, pitted and striated, coxæ, trochanters and femora mostly black, the anterior and middle femora tipped with yellow, tibiæ and tarsi brownish testaceous.

Abdomen.—The posterior margin of the first dorsal abdominal segment bordered by a yellow band which is prolonged obliquely forward to the anterior edge of the segment and nearly to its middle line; the second and third segments are conspicuously margined with yellow posteriorly, the fourth and fifth dorsal segments bordered with a yellowish line along the posterior margin.

♂.—7 mm.—*Head.*—No tubercle on the vertex; clypeus apparently wider than long.

Thorax.—Metathorax black; middle and posterior coxæ yellow anteriorly, as are the middle femora.

Abdomen.—With spines in the channel of the second dorsal segment and a thorn-like projection on the first ventral segment; with the exception of the apical yellow band on the first and second dorsal and second ventral segments the abdomen is black.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) papagorum n. sp.

Related to *toltecus*, from the description of which, in Saussure's Am. Wasps, it differs as follows:

♀.—9 mm.—*Head.*—Clypeus rather coarsely punctured, with some of the punctures apparently confluent, its anterior margin nearly straight, brown, and not much wider than the scape is thick, its posterior margin bordered with yellow, a yellow border along the lateral margin on the lower half; a yellow mark immediately above the insertion of the antennæ and a yellow mark on that portion of the face which borders along the emargination of the eye, a yellow line on each side of the head directly back of the eyes; a rounded depression on the vertex posterior to the anterior ocellus, this depression being large enough to snugly hold the anterior ocellus; scape yellow anteriorly; mandibles brown at apex, with a yellow mark near the base.

Thorax.—The anterior margin of the pronotum bordered with yellow, which extends back to the posterior margin along the middle third of the latter, the posterior margin in addition is partly testaceous to brownish in color; the tegulæ are mostly testaceous, with a brownish cast, but in addition they have a yellow mark on the anterior and posterior portions; postscutel distinctly convex, but not crested, with an undulated yellow line or band; posterior face of metathorax with its lateral rounded elevation covered with an elongate yellow mark; wings transparent, suffused with a smoky tint, which is deepened to fuscous in the cells along the anterior edge of the wing, especially in the marginal cell; anterior and middle femora black, brown and luteous, the posterior femora black and brown, tibiæ mostly ferruginous to reddish-brown, the middle and posterior pairs being ornamented with a luteous stripe on the external aspect; tarsi brownish testaceous, claws brown.

Abdomen.—Posterior edge of the 1st dorsal segment with a yellow border, as is the same edge on each of the other segments, excepting the first ventral, and the apical segment both dorsal and ventral; in addition there is a yellow on each side of the second dorsal segment.

♂.—8 mm.—*Head.*—Clypeus uniformly yellow, finely punctured; supraclypeal mark extending down to the posterior margin of the clypeus.

Thorax.—The middle and posterior coxæ are yellow anteriorly; the middle femora are armed with a kind of tooth on the inferior aspect in the middle.

Otherwise as in the ♀.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One paratopotype has a brownish testaceous mark on the posterior half of the dorsulum, this mark is barely represented in the type by two minute spots; another paratopotype has the latter mark

yellowish; the anterior margin of the clypeus blackish, and the posterior and lateral yellow margins of the clypeus joined together leaving the black portion of the clypeus in outline like a conventional toadstool.

This species was captured by F. H. Snow in August, 1902, and in July.

Odynerus (Stenodynerus) cochisensis n. sp.

Differs from the description of *vagus* (Sauss., Amer. Wasps) in structure, color and sculpture as follows:

♀.—7 mm.—*Head.*—Hardly wider than high; black and yellow; on the vertex nearly halfway between the anterior ocellus and the posterior margin of the head there is a small flat shining space which gives the appearance of being a flattened tubercle; mandibles brownish at tips, black along the edge, greater portion of basal two-thirds yellow; clypeus mostly yellow, the anterior lateral margin edged with black, the anterior margin brownish; the yellow mark between the insertion of the antennæ ovoid in outline; scape with its basal half and the anterior aspect of the remaining half yellow, the portion of the head fitting into the emargination of the eye completely yellow; cheeks with a yellow mark along the eye margin at the top of the head.

Thorax.—Apparently no flat space on either side of the metanotum adjoining the postscutel; metathorax rounded, the rugulose excavation not margined but bisected by a rather indistinct raised line; anterior half of the pronotum yellow, tegulæ yellow, excepting a testaceous cuneate mark in the middle; mesothoracic episternum with a yellow mark beneath the tegulæ, this mark separated by a black line; directly back of the tegulæ there is a yellow cuneate process and an almost quadrate yellow spot on the posterior third of the dorsulum; postscutel yellow; a large yellow mark on each side of the metathorax; wings transparent, somewhat clouded, especially in the cells along the anterior margin; coxæ mostly yellow in front and black behind; trochanters black; anterior and middle femora almost completely yellow; posterior femora mostly black, tipped with yellow; tibiæ and tarsi mostly yellow, the latter more or less brownish near the apex and at the apex; claws brown.

Abdomen.—Black and yellow; first dorsal segment with a yellow apical band that is prolonged anteriorly for a short distance along the lateral margin and then obliquely inward toward the middle line, making an interrupted transverse band with its fellow; the pattern on the dorsum of the second segment pretty much the same as on the first segment, but the oblique bands come closer together, and the yellow apical band is confined chiefly to the channel which is bounded apically by a low flange which when viewed from the side makes an obtuse angle with the rest of the segment; second ventral segment yellow, with the exception of a quadrate black area occupying the middle two-fourths of the basal two-thirds of the segment and a brown line in each yellow lateral border; third, fourth and fifth dorsal ventral segments with an apical yellow band; the following dorsal segments mostly yellow, the follow ventral segments mostly black.

♂.—7 mm.—Very like the ♀ in structure, sculpture and color.

Head.—No flattened tubercle back of the anterior ocellus, the vertex being uniformly closely punctured or rugose; the clypeus about as wide as long, entirely yellow; the yellow mark between the antennal sockets prolonged down to the clypeus.

Thorax.—The yellow on the metathorax reduced to a spot on each side, and but one spot on each mesothoracic episternum.

Abdomen.—There is a spot instead of an oblique band on each side of the first dorsal segment.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Three ♀ and three ♂ paratopotypes, the males are all practically alike, while in the females there is some variation in the maculation, notably in the clypeus, where the yellow is more reduced or more elaborate than in the type and on the scutel where two yellow spots present themselves; furthermore, the yellow of the metathorax and on the mesothoracic episternum is decreased or increased in extent as compared with the type.

All the specimens were taken in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) provisoreus n. sp. (Pl. XII).

Superficially like *spectabiliformis*, from which it differs, especially as follows:

♂.—14 mm.—In size, in the postscutel and in the abdomen, this is more like *Odynerus* s. s. than *Stenodynerus*. In structure it seems to come nearest to the group of which *O. flavopictus* is representative.

Head.—As long as wide, dullish, punctate, the punctuation pretty much the same as in *campestris*, black, yellow and reddish-yellow; clypeus entirely yellow, its anterior edge arcuate and about two-thirds as great as the anterior lateral margin, a transverse supraclypeal yellow mark with its lower margin emarginate and on a plane or nearly on a plane with the posterior or upper edge of the antennal sockets, the lower edge of the eye emargination bordered with yellow, a vertical reddish-yellow stripe bordering the portion of the eye nearest the anterior ocellus, another reddish-yellow stripe bordering nearly the entire posterior margin of the eye; mandibles mostly yellow, margined with blackish and brownish; scape yellow in front, reddish-yellow behind, pedicel and first joint of flagel entirely reddish-yellow, the remainder of the flagel almost entirely black, excepting the fourth joint of the antennæ which is partly brown; pubescence inconspicuous, golden, tinged with brown, in no place much longer than the pedicel.

Thorax.—Sculpture much the same as *campestris*, but there is a longitudinal impressed line on the anterior half of the mesonotum and the scutel in the middle; pubescence as on the head; black and reddish-yellow, the latter color being confined to the greater portion of the pronotum, including the anterior and posterior margins, tegulæ, a spot below the latter on the mesothorax and a spot on

each side of the scutel and postscutel; wings colored as in *tempiferus*; legs simple and more or less reddish-yellow, excepting the coxæ, trochanters and basal portion of the femora, claws castaneous.

Abdomen.—Very as in *tempiferus*, but the margins not wrinkled, simple, rather coarsely punctured; the black portion of the first and second dorsal segments not at all hourglass shaped, but more pyramidal; pubescence nearly as on the head.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Paratype ♂ differs from the type as follows: mesonotum with two curved reddish lines, tubercles brownish testaceous, second joint of the flagel mostly reddish, hook of antennæ brown.

Collected in August, 1902, by F. H. Snow.

Odynerus (Stenodynerus) yumus n. sp. (Pl. XIII).

Has much the same form as *taos*, but the second dorsal segment of the abdomen is reflexed as in *rectangulis* or nearly so. Compared with *taos* it differs as follows:

Head.—Practically the same, but 12th and 13th joints of antennæ cylindrical and of about the same width or diameter.

Thorax.—Rather dullish; scutel with a median longitudinal impressed line; postscutel not at all produced but rather flattened; metanotum with a yellow spot on each side; femora simple, the anterior and middle pair partly black, mostly yellow, the posterior pair mostly black, yellow only at tip, tibiæ also simple, almost entirely yellow, tarsi brownish testaceous.

Abdomen.—Practically as in *taos*, excepting as already described.

The yellow portions of this species, as represented by the type, are lemon yellow.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in July by F. H. Snow.

Odynerus (Maricopodynerus*) maricoporum n. sp.

Subgenerically related to the group represented by *toltecus*, from which it differs, especially in the peculiar abdomen. The points in which it differs from *toltecus*, see description "Syn. Amer. Wasps," Saussure, are as follows:

♂.—7 mm.—*Head.*—Clypeus apparently broader than long; black, clypeus entirely luteous, anterior aspect of scape luteous, with a brownish tint, above blackish, brown below, yellow markings of the face confined to that portion

* N. subg. Type *O. M. maricoporum* Vier.

which fills in the emargination of the eyes, part of the cheek and part of the vertex: vertex convex and uniformly closely punctured.

Thorax.—Rather cubical, the metathorax excavated, with the excavation shining and rather sparsely punctured with fine punctures; black, with pubescence nearly as on the head where it is about the same as in *papagorum*, anterior third of pronotum yellow, its posterior margin partly brownish testaceous, mesopleura with a large yellow spot that almost adjoins the tegulæ, which latter are brown, with a yellowish tinge on the anterior margin, a yellow spot on each side of the scutel, postscutel traversed transversely by a yellow line, metathorax mostly ferruginous, with practically only its dorsal aspect black; legs largely ferruginous; trochanters and coxæ partly blackish, as are the tibiæ and the bases of the femora, anterior femora with a yellow or luteous mark on the outer aspect; anterior, middle and posterior tibiæ yellow externally, tarsi fuscous at base, brownish at apex.

Abdomen.—Partly black, pubescent, like *papagorum;* first dorsal segment with a deep pit immediately anterior to its posterior margin; second dorsal segment nearly twice as long as wide at its base and forming a sort of canopy over all the succeeding segments; beyond the second segment seemingly smooth and impunctate; first segment mostly ferruginous, with the dorsal apical margin yellow, bordered with black anteriorly to the yellow; second dorsal segment margined with testaceous, with its black split up into five lobes by a luteous mark; second ventral segment mostly black, partly testaceous, with the entire posterior margin testaceous, beyond the second segment the exposed portions of the segments are testaceous.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August, 1902, by F. H. Snow.

Pepsis angustimarginata n. sp.

Related to *atalanta, cerberus* and *basifusca.*

♀.—26 mm.—Almost entirely Prussian blue, with a sericeous sheen, excepting the antennæ and tarsi which are blackish. Wings reddish, brownish-yellow, the extreme base blackish, the apical half more of a yellowish than the basal half, the apex and the posterior margins of the posterior wings, and the greater part of the apical portion of the posterior margin of the anterior wings bordered with fuscous, the fuscous not extending half way into any of the cells it margins.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Collected in August by F. H. Snow.

Paratype ♀ 23 mm., from Salt Lake City, Utah, July 25, 1897.

Gorytes subaustralis n. sp.

Closely related to *phaleratus,* of which it may prove to be a race.

Black, with exceptions as noted in the following description.

♀.—12 mm.—*Head.*—Eyes as in *decorus*, that is converging toward the clypeus' the distance between the eyes at the base of the clypeus being one-half or nearly one-half as great as the distance between the eyes along an imaginary straight line drawn from eye to eye and through the center of the posterior ocelli; front with fine, sparse punctures, some of which are as much as .5 mm. apart; clypeus nearly twice as broad as long, yellow, convex, indistinctly punctured, more sparsely so than the front and with a dimple near the center; that portion of the face which lies between the eyes, clypeus and insertion of the antennæ is yellow; antennæ thicker beyond the middle than before, scape easily twice as thick as the first joint of the flagel and as long as or nearly so as the first joint of the flagel and pedicel, yellow, flagel pale brown, its first joint a little longer than the second, pedicel concolorous with the flagel, mandibles black at tip, yellow at base and brown between.

Thorax.—Smooth, polished, dorsum appearing dullish, apparently on account of the presence of an indefinable pubescence, pronotum, tegulæ, posterior and anterior margins of the propleura, mesonotum with a yellow margin laterally, anterior and inferior aspects of the mesothorax separated from each other by an arcuate channel that originates approximately .5 mm. posterior to the posterior margin of the tegulæ and extends as one continous channel, which almost attains the channel between the meso- and metapleura, the latter have a large mark which occupies nearly all of the anterior half of its lateral aspect; mesosternum with a median furrow along which there is an indistinct ridge, otherwise much the same as the dorsulum; a little more than the posterior half of the scutel, and the posterior two-thirds of the postscutel yellow; metathorax smooth and pubescent in much the same way as the mesothorax, a fork-like impression extending from the inferior portion of the posterior aspect of the metathorax to the middle of the postscutel, laterally the prongs of this fork extend from the center or near the center of the metathorax to a point on a line with the posterior interior point of the wing insertion, the diverging impressions forming the enclosure, which is bisected by the prolongation of the median impression, all the impressions slight, except the posterior half of the longitudinal one; tibiæ and tarsi spinose; wings strongly brownish-yellow, excepting the apical fourth which is mostly pale and more of a yellowish hyaline color than the marginal cell which in turn is fuscous, stigma brownish testaceous, nervures brownish, excepting those of the basal half of the wing which incline testaceous, a little more than the posterior two-thirds of the postscutel and of the posterior half of the scutel, an almost oval spot on each side of the metathorax taking up nearly all of its surface and leaving only a margin of black externally and internally and not encroaching upon the enclosure, yellow, legs mostly brownish-yellow, coxæ black, trochanters, basal and posterior portions of the posterior femora more or less dark brown; pulvilli brownish.

Abdomen.—Smooth and shining and pubescent in much the same way as the thorax, mostly yellow, lateral margins of the first ventral segment black, on the second ventral segment there is an almost tongue-shaped dark brown mark which extends from the base to a median circular apparently bronzy space near the apex, the succeeding ventral segments excepting the apical one are brownish to blackish at base, first dorsal segment with a median brownish line on the anterior half and a narrow almost blackish border posteriorly, the three succeeding dorsal segments have a blackish margin at base beyond which the second seg-

ment is castaneous, the apical dorsal segment is a practically triangular plate that is distinctly though not strongly margined, and approximately one and one-half times as long as wide at its base, its surface roughened, appearing closely, indistinctly, longitudinally striate, on each side of the plate the tegument is shining and somewhat more sparsely punctured than the front, this structure is practically duplicated on the corresponding ventral segment, the punctuation on the latter is, however, not nearly so distinct as on the former.

Type.—University of Kansas.

Type locality.—Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., 6000 ft. elevation, Arizona.

Collected by F. H. Snow.

Gorytes papagorum n. sp.

Closely related to *phaleratus*, of which it may be a race. Ground color black.

♀.—11 mm.—*Head.*—Front smooth and shining, with a few small punctures, clypeus with more numerous punctures than the front, but less distinct; scape as long or nearly as the pedicel together with the first joint of the flagel, the latter distinctly longer than the next, but not as long as the second, plus half of the third, pedicel and flagel mostly brown; greater part of the basal half of the mandibles, clypeus and face below antennæ, a prolongation along the inner eye margin and the greater part of the scape yellow.

Thorax.—Rather dullish, though somewhat shining above; mesosternum anteriorly distinctly carinated, the upper third of the mesopleura not separated from the lower two-thirds, suture between the scutel and mesonotum not foveolate; wings strongly brownish in the marginal cells, elsewhere more of a yellowish-brown, transparent, nervures brownish, stigma yellowish; pronotum, tubercles, a margin along the mesonotum where it joins the tegulæ, a mark on each mesopleuron, posterior half of scutel, posterior two-thirds of the postscutel and a mark on each side of the metathorax, yellow; anterior and middle tibiæ in front and all tarsi yellow; tibiæ and claws mostly brown; tegulæ brownish testaceous.

Abdomen.—Greater part of first and of the succeeding segments yellow.

♂.—Essentially like the female.

Types.—University of Kansas.

Type locality.—Oak Creek Canon, 6000 ft., elevation, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Six specimens collected by F. H. Snow.

Three ♀ paratopotypes differ from the type, apparently only in color; in two of these specimens the second dorsal abdominal segment is quite brown, the one having nearly all of the basal two-thirds and the other the basal half brown; in the third ♀ specimen the metanotum has a yellow spot on each side; the ♂ paratopotype has its antennæ tipped with black.

Crabro cinctibellus n. sp.

Predominating color black; pubescence golden and mostly inconspicuous.

♀.—10 mm.—*Head.*—Very as in *bellus*, its scrobe which is nearly as long as the first joint of the flagel and nearly four times as long as wide, lies parallel to the inner eye margin, from which it is separated by a space about equal in width to the shortest diameter of the scrobe itself, the posterior edge of the scrobe is practically tangent to an imaginary line drawn across the vertex immediately anterior to the posterior ocelli; front, clypeus and malar space with conspicuous pubescence; scape and pedicel almost entirely yellow.

Thorax.—Propodeum nearly as in *interruptus*, its dorsal aspect separated from the posterior aspect by an impressed line rather than a series of foveæ; tibiæ and metatarsi almost entirely yellow, pronotum yellow, excepting a medial quadrate black space, which separates the yellow into two parts, two oval yellow spots on the scutel, tubercles and tips of femora yellow; tarsi mostly brownish, as are the claws; wings transparent and brownish, stigma and nervures of anterior margin and basal half of the wing brownish testaceous, remainder of nervures brown.

Abdomen.—With a transverse band on each of the dorsal segments, except the apical one, yellow; excepting the band on the penultimate segments, the bands of yellow are narrower in the middle than laterally; the dorsal segments have the greater part of the apical fourth depressed below the level of the remainder of the segment, this depressed portion as well as the basal third of the segments are not yellow, pubescence quite conspicuous on the apical segment.

♂.—8.5 mm.—Sufficiently like the opposite sex, to be recognizable by comparison with the description of the latter, the posterior aspect of the metathorax is more rugose than in the female and not separated from the dorsal aspect by an impressed line or a series of foveæ; each of the dorsal abdominal segments has a yellow band analagous to that of each of the segments 1-5 in the female, but with the band on the first, second, third and seventh segments interrupted by a narrow brown line.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One ♀ paratopotype is somewhat larger than the type. Two male paratopotypes seemingly differ from the type only in having all the yellow abdominal bands except the apical one entire.

Taken in August, 1902, by F. H. Snow.

Crabro papagorum n. sp.

Related to *nigrifrons*. Black, with yellow markings.

♀.—10 mm.—*Head.*—Presumably very much the same as in *nigrifrons*.

Thorax.—Pronotum and tubercles very likely as in *nigrifrons*, or nearly so; dorsulum and scutel so closely punctured as to appear granular although manifestly punctate in certain parts, mesopleura as in *nigrifrons;* metathorax above as in *nigrifrons*, with exception of the longitudinal furrow, which is not much

longer than twice its width at the base, its posterior face appearing sculptureless with rather distinct margins laterally toward the apex; metapleura delicately striated; mesothorax and metathorax black, excepting the appendages, which are as follows: tegulæ mostly testaceous, margined with yellow; wings transparent, tinted with brownish testaceous, stigma and nervures mostly brownish testaceous; middle and posterior femora and their metatarsi yellow, excepting a short brown line on the inner aspect of the middle tibiæ, and a brown edge on the apical margins of the middle and posterior tibiæ, middle and posterior femora tipped with yellow, posterior femora also tipped with brown, excepting the apical tarsal joint, which is brown and practically concolorous with the claws, the tarsi are yellow or yellowish.

Abdomen.—Quite smooth, with none of the segments noticeably depressed, with a yellow spot on each side of the first dorsal segment; second, third and fourth dorsal segments with a transverse, medially constricted, yellow line on the basal half; greater portion of the fifth dorsal segment yellow; a yellow spot on each side of the sixth dorsal and corresponding ventral segment.

Pubescence.—Rather long, thin and silvery, except on the apical abdominal segment, where it is somewhat yellowish.

Type.—University of Kansas.

Type locality.—Thomas' Ranch, 6000 ft., Oak Creek Canon, 20 miles southwest of Flagstaff, Coconino Co., Arizona.

Taken in August by F. H. Snow. One female with head and prothorax missing.

Crabro canonicola n. sp.

Related to *Maculipennis*, from which it differs in the characters here described; mostly black, with yellow markings; pubescence inconspicuous, with a golden tint; abdomen, especially the second segment, distinctly punctured, its dorsal segments, excepting the apical one, banded with yellow.

♀.—10 mm.—*Head.*—Very as in *confertus*, its scrobe forming an almost acute angled triangle, with the base nearly half as great as the altitude, and tangent to an imaginary straight line, which latter is in turn tangent to the anterior margin of the posterior ocelli, outer side of scrobe almost adjoining and parallel to the inner eye margin; the following parts are yellow; scape, part of pedicel, greater part of clypeus and mandibles, except their brownish tips.

Thorax.—Pronotum quite as in *ventralis*, dorsulum more closely punctured than the vertex and duller, scutel polished with its punctures more separated than those on the dorsulum, episternal suture of mesopleura not conspicuously foveolate, base of metanotal enclosure nearly as in *maculipennis*, its central furrow nearly quadrate, shining and rugulose, the ovoid polished spaces of the metanotum surrounded by a foveolate furrow, the posterior aspect of the metathorax uniformly smooth and shining, separated from the metapleura by a slender ridge, the following parts are yellow: tibiæ almost completely, except for the brown tips, pronotum, tubercles, episternum mesopleuralis, anterior and posterior edges of the tegulæ, greater portion of the scutel, a spot on each side of thorax directly

anterior to the scutel, greater portion of the oval spaces on metanotum, trochanters mostly, anterior and middle femora in part, posterior femora at apex, and the greatest portion of the basal tarsal joints; wings very as in *maculipennis*.

Abdomen.—Greater portion of venter yellow; first, second, third and fourth dorsal segments blackish at base and apex; dorsal apical segment yellow on each side, the corresponding ventral segment with a yellow spot on each side.

Types.—University of Kansas.

Type locality.—Thomas' Ranch, Oak Creek Canon, 6000 ft., 20 miles southwest of Flagstaff, Coconino Co., Arizona.

One paratopotype. Both the latter and the type were taken in August by F. H. Snow.

Carolinian Species.

Phænodus caddous n. sp.

Mesonotal furrows not sharply defined on the anterior half of the sclerite and represented on the posterior half thereof by low rounded raised lines that converge and separately meet or nearly meet the posterior border mesonotum.

♀.—3 mm.—*Head.*—Smooth, more or less polished and shining and seemingly without sculpture of any kind, different shades of castaneous; the mandibles yellowish testaceous; eyes black; antennæ with the first eighteen joints brown-testaceous to brown in color, the next joint yellowish-brown, the next five joints or the remainder of the antennal joints brown, the scape nearly twice the length of the pedicellum; the combined lengths of the scape and pedicellum not much longer than the first joint of the flagellum, joints of the flagellum subequal.

Thorax.—In color about the same as the head, with the exception of the dorsulum, each side of which is partly blackish; dorsulum finely sculptured in part and shining, on the anterior half of this sclerite the space between the parapsidal grooves or where they ought to be is rugose, as seem to be the parapsidal grooves themselves, posteriorly the middle portion of the same region is granular; mesopleura with an irregularly shaped, impressed, smooth, partly polished, partly granular area occupying the greater part of the lower half of this sclerite, and a small portion of the upper half, and surrounded by rugose grooves and a rugose area, the latter occupying the greater portion of the upper half of the mesopleura; metathorax with its sides rugose, the superior and posterior aspects of the metathorax areolated, the posterior aspect in addition transversely reticulated, the areolation consisting of six areas formed by an almost equilateral triangle enclosed by raised lines and with its base occupying the middle third of the junction between the dorsal and posterior aspects of the propodeum, by prolongations of the raised line forming the base of the triangle and extending to the lateral margin of the metanotum and finally by nearly parallel raised lines extending from the base of the triangle to the apex of the segment and marking off the middle fifth or practically the middle fifth of the posterior aspect of the metathorax, the spines of the metathorax springing from a point near or at the middle of the junction of the sides of the metathorax, with the upper and poste-

rior aspects thereof; these spines are each rather blunt and about as thick and long as the last two joints of the antennæ and directed backward, a little downward and a little backward; wings somewhat clouded with brownish but transparent; nervures brownish, stigma yellowish testaceous, with a brownish tint, the second abscissa of the cubitus approximately as long as the first abscissa of the radius which in turn is about two-thirds as long as the radial side of the stigma; legs apparently simple and yellowish testaceous.

Abdomen.—Smooth and polished, castaneous to blackish, the second dorsal segment greater in extent than the rest of the exposed portion of dorsum of abdomen put together, about as wide on each side as at apex, which last is approximately one and one-half times as wide as at base; the first dorsal segment with a median longitudinal parallel sided, elevated, longitudinally striated space which is as wide as the segment at its base and separated from a smooth polished triangular space on each side by rather salient edges; ovipositor springing from the apex of the abdomen of equal length or nearly, the portion prolonged beyond the tip of the abdomen, a little shorter than the metatarsus of the posterior legs.

Types.—University of Kansas.

Type locality.—Lawrence, Kansas.

One specimen taken in June at twilight by E. S. Tucker.

Hedysomus wichitus n. sp.

Submedian cell of anterior wings a little longer than the median on the externo-medial nervure; front excavated and polished between the insertion of the antennæ and the ocelli; second joint of the antennæ about one third as long as the third; first transverse cubitus represented by a stump of a nervure not as long as the first abscissa of the radius and which if completed would presumably be interstitial with the recurrent nervure.

♀.—3.5 mm.—*Head.*—Antennæ seemingly as long as the head, thorax and abdomen combined, apparently 23-jointed, the joints soldered together, so as to preclude their positive differentiation, even with the aid of a lens magnifying twenty diameters; head apparently uniformly sculptureless and polished.

Thorax.—More or less granular, shining; parapsidal grooves distinct on the anterior half of the dorsulum, extending to the posterior margin of this sclerite, but not so distinct on the posterior half on account of the rugulose tegument between in this region, metanotum with a somewhat triangular area occupying nearly all its area, smoother and more shining than the adjoining parts and longitudinally bisected by a rather low, indistinct ridge, which is just about as conspicuous as the ridge, which imperfectly encloses the areas.

Abdomen.—Mostly granular and shining, partly smooth and polished; the first dorsal segment longitudinally rugulose, appearing somewhat longitudinally striate; the second dorsal segment not so coarsely sculptured as the first and divided into three parts by lateral longitudinal furrows that are not deeply impressed but still distinct, the lateral parts triangular and equal the central part nearly oblong and a little wider at base than at apex; the third and fourth dorsal segments much the same in sculpture as the succeeding ones, but with a faint shining, median, longitudinal raised line on the basal half.

Color.—Blackish and brownish; head brown; flagel mostly sort of a blackish testaceous; scape and legs practically entirely honey-testaceous; wings clear, with the stigma and nervures less brown to brownish testaceous.

Type.—University of Kansas.

Type locality.—Lawrence, Kansas.

One specimen taken at twilight in August.

Upper Sonoran Species.

Odynerus (Stenodynerus) congressus n. sp.

Differs from the description of *mystecus* (Sauss. Am. Wasps), as follows:

♀.—8 mm.—*Head.*—Clypeus not reticulate-rugose, but with coarse, mostly separated punctures, prolonged into two rather long teeth with a deep emargination between, its basal third luteous, like a line along the lower margin of the emargination of the eye and a somewhat Y-shaped mark above the insertion of the antennæ; a yellow spot behind each eye.

Thorax.—Edge of the pronotum not at all punctured, metathorax smooth or finely striate and punctured, not at all velutinous; anterior third of the pronotum yellow, tegulæ excepting a testaceous spot near their center and a concolorous margin, luteous, the following places also luteous: mark beneath the tubercles; postscutel and a spot on each side of the metathorax yellow, femora mostly black, with a brownish stripe above and a yellow mark at apex, anterior tibiæ striped with yellow, brown and black, middle and posterior tibiæ mostly brown and yellow, all tarsi and claws more or less dark brown.

Abdomen.—First dorsal segment with a yellowish luteous border along its apical margin, the border being prolonged on each side, apical margin of the second dorsal segment rather luteous, the corresponding ventral segment of a similar color on each side, the pale color shading off into a narrow line of brown in the middle of the segment.

Type.—University of Kansas.

Type locality.—Congress Junction, Arizona.

Taken in July by F. H. Snow.

Lower Sonoran Species.

Odynerus pimorum n. sp.

Pubescence inconspicuous, silvery, mostly yellow.

♂.—11 mm.—*Head.*—Emargination of eye practically parallel sided and nearly twice as long as wide across the middle of its short diameter, clypeus occupying the greater part of the lower half of the face and nearly as wide as long, convex, smooth, apparently impunctate and covered by a short appressed pubescence, which in certain lights obscures the surface and gives it a silvery sheen, anterior margin regular and about as long as the lateral margin; vertex with a longitudinal rather indistinct impression extending from near the anterior ocellus posteriorly close to the posterior margin of the head; a black area

across the vertex from eye to eye and encircling the ocelli, this black arc extends backwards forming a border along the superior posterior portion of the head, flagel almost completely pale brown, its tip, which is somewhat recurved and apparently spatulate, dark brown.

Thorax.—Metathorax distinctly biconvex, shining and punctured in much the same way as the dorsulum, the excavation of the metathorax represented by a smooth line at the base of the groove between the two concavities, no lateral sharp ridges, the metathorax being rounded off laterally and devoid of processes at its junction with the abdomen; dorsulum with a broad median brown line extending from its anterior margin nearly to its posterior margin; on each side of the dorsulum there is a black mark extending from the junction of the anterior with the middle third, but not from the margin of the pronotum, back to the posterior margin of the dorsulum where it joins the black line along the suture between the dorsulum and scutel, the latter mostly yellow, with a longitudinal, bisecting, impressed line, most of the sutures of thorax brown or brownish; wings transparent, with a fuscous tinge; the apical cells and those along the anterior margin of the front wings clouded with fuscous; legs almost completely yellow.

Abdomen.—First segment nearly as long as wide at apex, smooth and finely, rather closely punctured; second segment a little wider at apex than long, punctured about like the preceding segment, succeeding segments more and more finely punctured, apical segment impunctate or practically without punctures; first segment with a brown mark basally on its dorsum and apically on its venter, second segment brown at its extreme base, with a greenish transverse line between the apical and middle thirds, the succeeding dorsal segments, except the ultimate and penultimate partly greenish, mostly yellow, penultimate segment black at base, mostly yellow beyond and partly greenish, apical segment black, with a brownish margin posteriorly, ventral segments yellow, with the following exceptions: third, fourth and fifth with a brown spot on each side at base, sixth black to brown at base, greenish along its apical margin, seventh blackish, with a trilobate yellow mark.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Collected in August by F. H. Snow.

Odynerus pulverulenta n. sp.

Related to *saussurei*, from which it differs chiefly in the punctured first and second abdominal segments, and in the dull yellow livery. Black, with yellow to brownish-yellow markings.

♀.—10 mm.—*Head.*—Shining, closely punctured, except on the cheeks and vertex, where the punctures are more separated than on the front, an irregular depression on the vertex on a line with the median ocellus, clypeus smooth and shining, somewhat striate with the striæ terminating in the sparse punctures; pubescent in such a way as to have the appearance of being dusted with a subtle yellowish powder; two spots on the anterior margin of the clypeus are yellow as are the following parts: a cuneate mark on each side of the posterior margin of the clypeus, an emarginate mark between the antennæ at their insertion, lateral

face mark along the eye margin between the clypeus and the beginning of the lower side of the emargination of the eye, and a stripe on the scape anteriorly.

Thorax.—With pubescence like on the head, mostly closely punctured in much the same way as the face, metathorax distinctly concave and bounded by a salient margin, which is produced into a rather acute angle near the middle of each side of the outermost edge of the basin of the metathorax, this basin striate and uniformly dullish, following parts yellow: anterior and posterior margins of pronotum, a spot on each side of scutel, post scutel and the lateral margins of the posterior face of the metathorax; wings brownish, with a yellowish cast, the marginal cell distinctly infuscated.

Abdomen.—Dullish and finely sculptured, except for the scattered indistinct pit-like punctures, apical margin of second, third, fourth and fifth dorsal segments very coarsely, deeply and closely punctured, ventral surface similarly sculptured to the dorsal surface, but with the pit-like punctures represented by distinct strong punctures, and the margin of the second, third, fourth and fifth segments much narrower and not so coarsely punctured, the following yellow: a band at apex of each of the dorsal segments, the second, third, fourth and fifth ventral segments and the sixth ventral mostly, the latter tinged with brown and partly brown the same as the corresponding dorsal segment, which latter is an exception to the statement made for the dorsal segments in that the brown color extends from base to apex along the middle portion.

Types.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Captured in August by F. H. Snow.

Odynerus (Stenodynerus) anormiformis n. sp.

Similar to *anormis*, from which it can be separated at a glace by the predominating brownish ferruginous color. From the description of *anormis* (Sauss., Am. Wasps) it differs chiefly as follows: brownish ferruginous in color, excepting the eyes, ocelli, luteous ornaments and black of abdomen.

♀.—7 mm.—*Head.*—With luteous ornaments as follows: base of mandibles, basal half of clypens, a somewhat V-shaped large mark on the front extending down to between the insertion of the antennæ and occupying that part of the face which fills the emargination of the eye and stripe adjoining the upper half of the posterior margin of the eye.

Thorax.—Luteous, as follows: greater part of the anterior half of pronotum, with the exception of a narrow interruption along the middle line, a spot on the dorsulum near the scutel, tips of anterior and middle femora and a mark and stripe on each tibia; wings transparent, somewhat smoky, with the apex of the marginal cell infuscated.

Abdomen.—The edge of the second segment not conspicuously different in punctuation from the remainder of the segment, greater part of second, third, fourth, fifth and sixth segment blackish, the following luteous: posterior third of first dorsal with its lateral prolongation extending to a little before the middle of the segment along the lateral margin, a circular spot on each side of the second

dorsal, an apical margin on the latter occupying nearly one-fourth of the exposed portion of the segment, a corresponding border on the second ventral and on fourth dorsal segments.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Collected in August by F. H. Snow.

Odynerus (Stenodynerus) gulielmi n. sp.

Related to *xanthianus*, from the description of which (Sauss., Am. Wasps) it differs as follows: black, with pale markings.

♀.—9 mm.—*Head.*—Basal third of clypeus yellow, as are the following parts: scape anterorly (brownish basally), a mark between the insertion of the antennæ and extending a little above the same, and another mark on the face above, filling the emargination of the eyes and a stripe back of each eye and adjoining the upper half of the posterior margin of the latter.

Thorax.—Postscutel elevated, almost crested along the anterior margin, uniformly, strongly punctured, the punctures about the same in size as those on the head and abdomen; the following parts luteous: anterior half of pronotum mostly tegulæ, excepting a central testaceous area, a mark on dorsum back of tegulæ and a stripe on the apical half of the anterior and middle femora; there is a luteous stripe on each of the tibiæ; coxæ and trochanters mostly black; femora and tibiæ mostly brownish to brownish ferruginous, tarsi and claws completely brown; wings as to color about as in *anormiformis*.

Abdomen.—Second segment punctured much the same as in *anormiformis*; a triangular border along the posterior margin of the first dorsal segment with a lateral prolongation yellow, a spot on each side of the last named segment and its apical margin luteous, the following also luteous; apical margin of the second and third ventral and apical margin of fourth and fifth dorsal segments.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

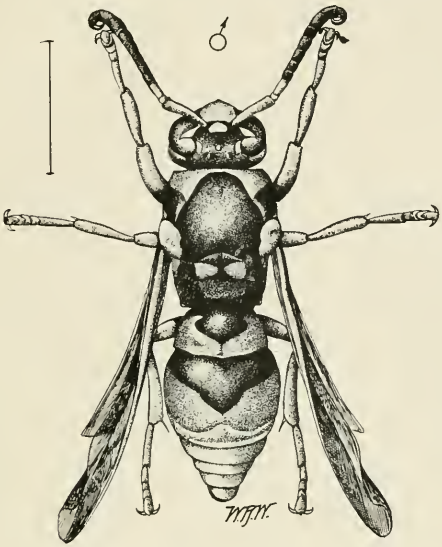
Collected in August by F. H. Snow.

Gorytes gulielmi n. sp.

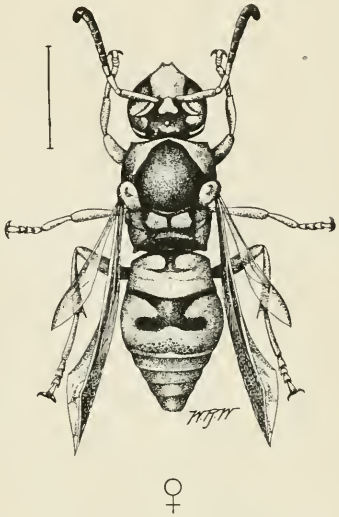
Related to *hamatus*. Black, with pale markings.

♀.—7 mm.—*Head.*—Front distinctly punctured, the punctures irregularly separated and nowhere adjoining; scape almost as long as the combined length of the three following joints of the antennæ, first joint of flagel nearly as long as the two following joints together, the following parts yellow; clypeus, excepting the brown anterior margin, the mandibles at base, the scape in front, and a margin along the eyes on the face.

Thorax.—Dorsulum mesopleura and metathorax with rather large separated punctures, exclosure of the latter rather poorly defined and traversed by almost adjoining longitudinal striæ, mesopleura distinctly carinated, but not at all distinctly separated into two areas each; tibiæ and tarsi with rather sparse weak bristles, wings clear, excepting a fuscous cloud which occupies practically all of the marginal and first submarginal, fully half of the half of the second submarginal and a small portion of the third discoidal cells, there is also a fuscous spot,



ODYNERUS PROVISOREOUS



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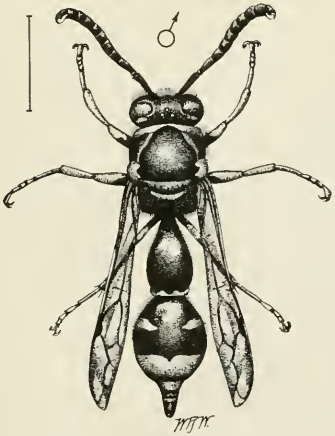
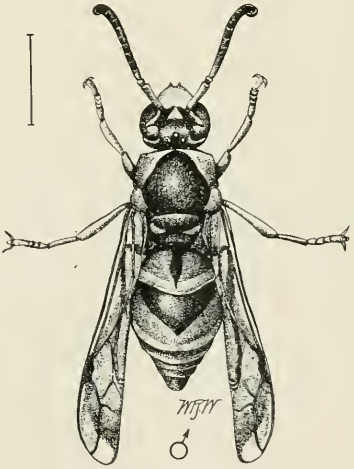
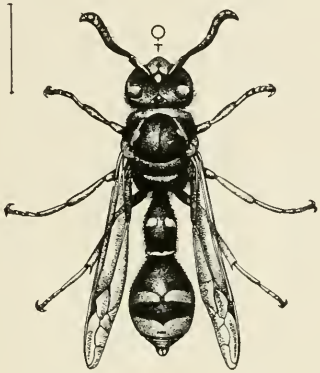


EUMENES ENIGMATUS

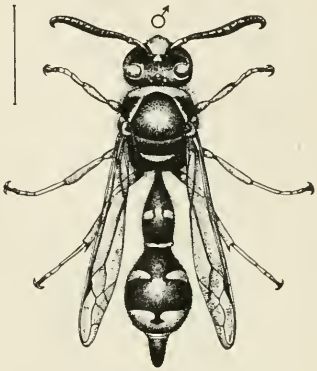


ODYNERUS CANALICULATUS

VIERECK ON HYMENOPTERA.

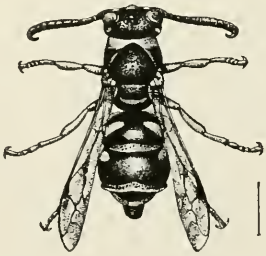


Eumenes cruciferorum



Eumenes cruciferorum

Odynerus yumus



VIERECK ON HYMENOPTERA.

though not so intense a one in the apical portion of the first discoidal cell; following parts yellow: pronotum, tubercles, a somewhat cuneate mark along the upper margin of the mesopleura, posterior two-thirds of scutel, a spot on each side of mesonotum, anterior and middle femora and tibiæ, the former apically, the latter in front, the greater part of the front and posterior femora, as well as a stripe on the posterior aspect of femora and the greater part of the anterior and middle tarsi; posterior tarsi brown.

Abdomen.—Strongly punctured, with its punctures well separated, the apical dorsal segment apparently without a pygidial area; an apical margin on each of the dorsal segments, excepting the apical one, yellow.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Taken in August by F. H. Snow.

Nysson intermedius n. sp.

Black, with pale markings.

♀.—8 mm.—*Head.*—Cheeks not margined posteriorly but punctured, with the punctures well separated and deep, sculpture of front hidden by appressed pubescence somewhat tuberculate between the insertion of the antennæ, clypeus rather closely and distinctly punctured and depressed along the apical margin, the apical half of the antennæ much thicker than the basal half, the apical joint forming sort of a truncated cornucopia, seen from below this latter joint looks like the apical joint of the antennæ in a male *Odynerus*, i. e. as if there existed a hook flexed upon the joint proper, part of the scape and pedicel reddish-brown, flagel dark brown to blackish, mandibles dark brown at base and apex, yellow in between, front pubescent like side of metanotum.

Thorax.—Dorsulum apparently rugoso-punctate like the scutel, which latter is apparently without a margin laterally, mesopleura coarsely punctured, but not so coarsely as the dorsulum; metathorax with a strong spine on each side, the enclosure rather protuberant and not well defined, longitudinally striate, some short spines on the posterior aspect of hind tibiæ; wings transparent, with a brownish tinge; the nervures and stigma blackish, petiole of the second submarginal cell, and the cell itself about as long as the cell is high, pronotum with a yellow line on each side nearly forming a continuous band, tubercles partly yellowish, tips of metathoracic spines yellowish, coxæ brownish to blackish, rest of legs mostly ferruginous, tarsi and tibiæ partly brown, side of metanotum and postscutel with a more or less dense, conspicuous, appressed pubescence.

Abdomen.—Distinctly closely punctured, the dorsal apical segment bidentate, with a slight elevation between the teeth, a yellow border at apex of first and second dorsal, second, third, fourth and fifth ventral segments; the third, fourth, fifth and sixth dorsal segments with an elongate yellow mark on each side, nearly forming a continuous border, greater part of the basal half of the first dorsal segment pubescent in much the same way as the sides of the metanotum.

Type.—University of Kansas.

Type locality.—Bill William's Fork, Arizona.

Captured in August by F. H. Snow.

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